Architectural Forum / the magazine of building / May 1958

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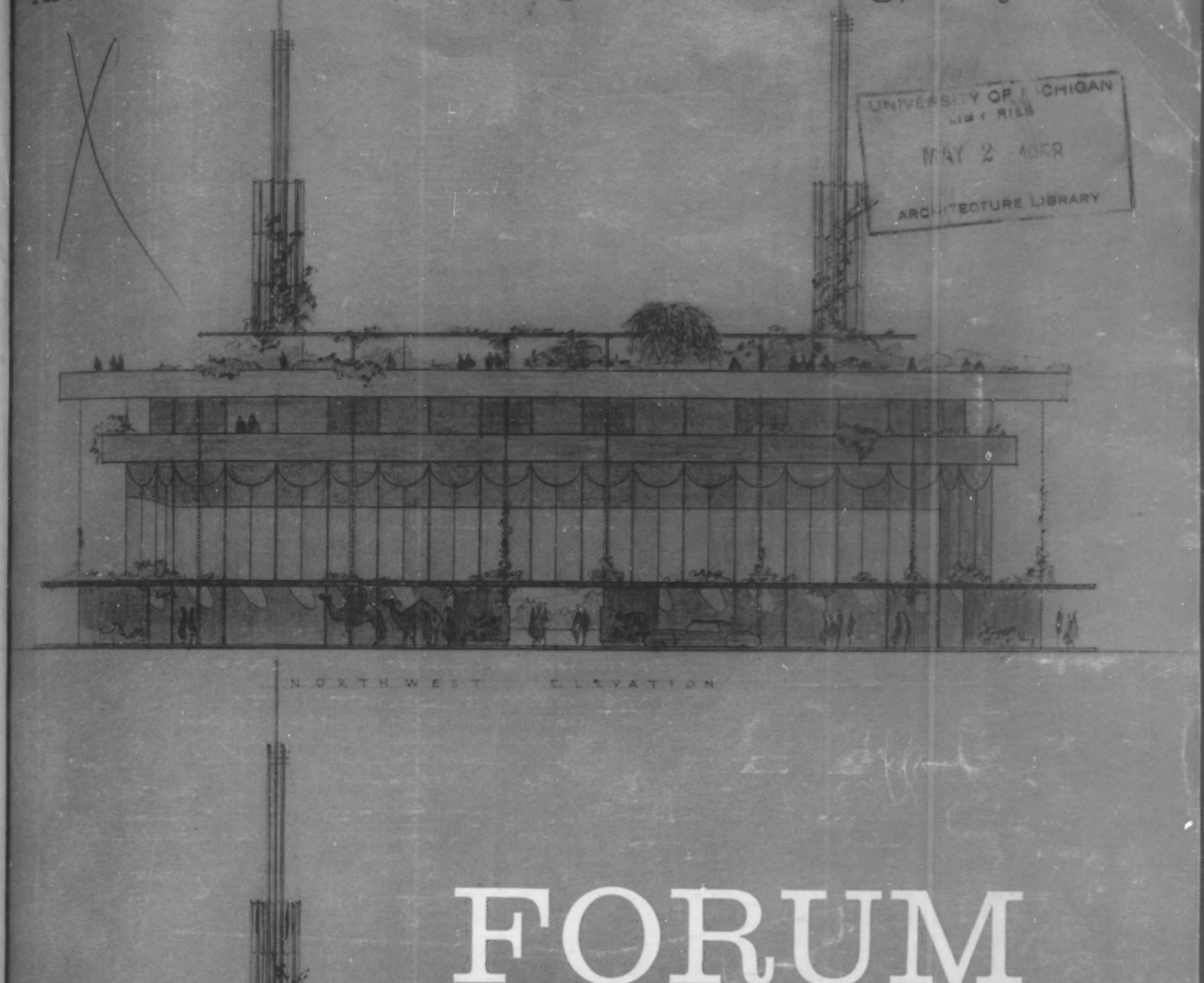
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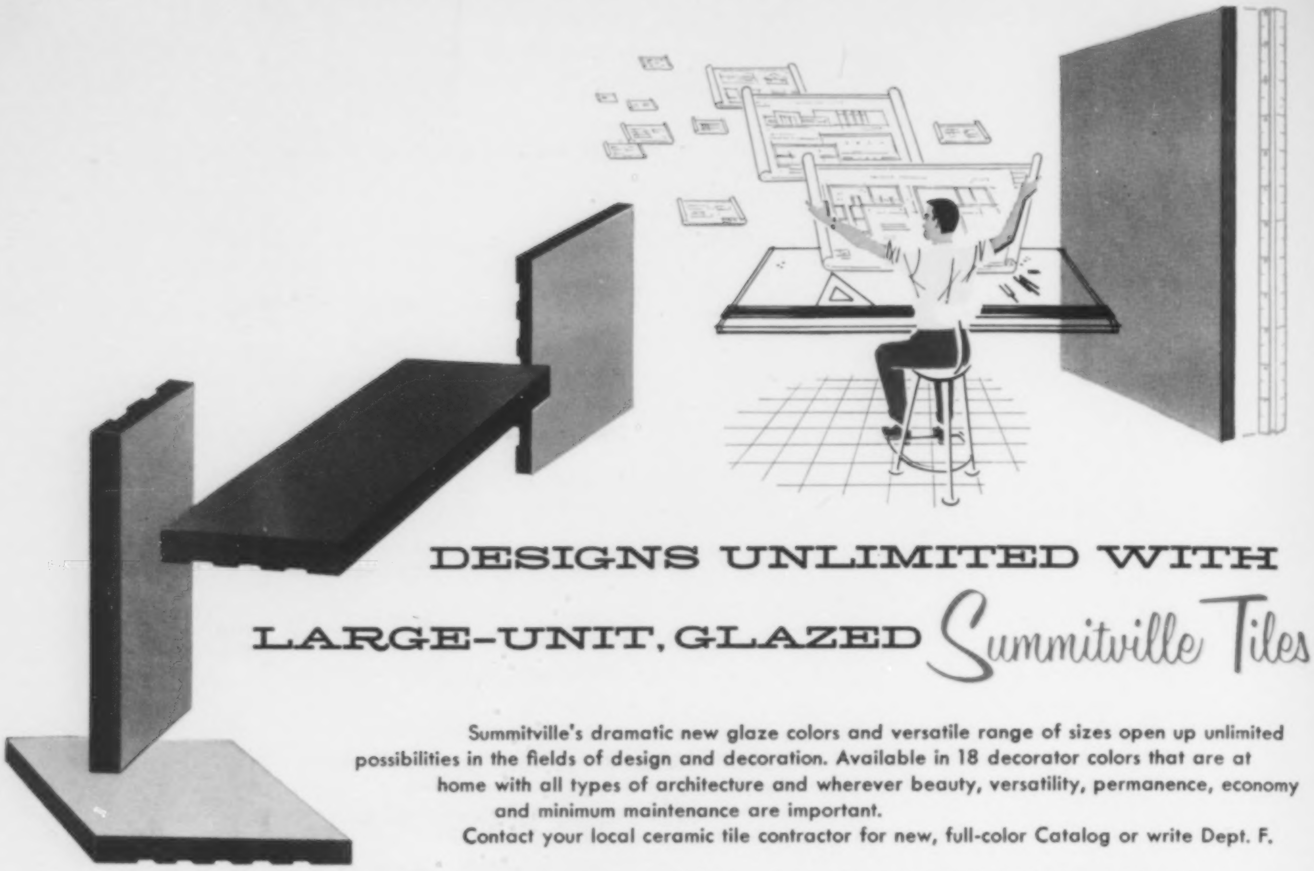

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# Giant Computers are made here

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Engineers: **R. F. Giffels and V. E. Vallet, Detroit, Mich.**

Contractors for heating and air conditioning:

**Rowland Tompkins & Sons, Hawthorne, N. Y.**

**Carrier Corporation, New York City**—subcontractor

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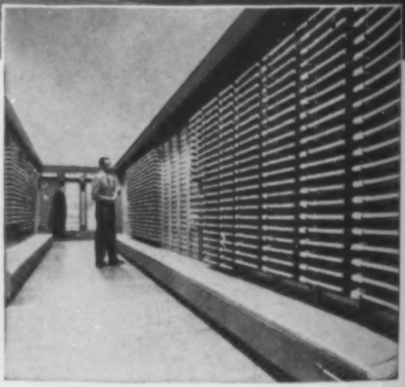
Focal point of the SAGE Air Defense System is the round scope portion of Display Console shown in photo at right. It can depict the over-all battle or focus on part of it. Powers Precision Control of Temperature and Humidity is important in all spaces shown here at the IBM Kingston Plant

One of the SAGE Air Defense System Display Consoles.



Input frames (front view) thru which all radar information is processed.

View of Pluggable Unit Assembly department.

One of many Quality Control areas.

View of Manufacturing-Engineering department.

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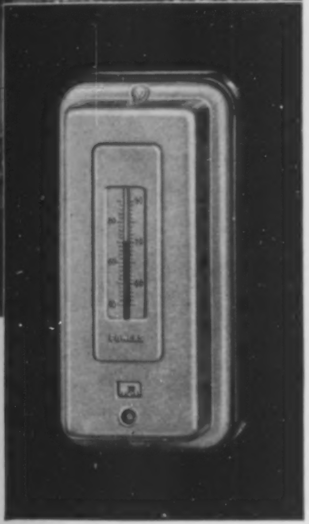

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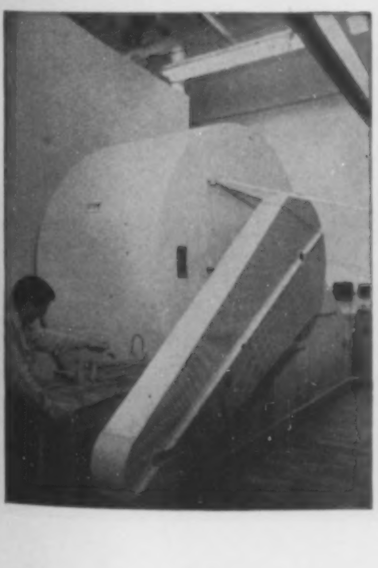
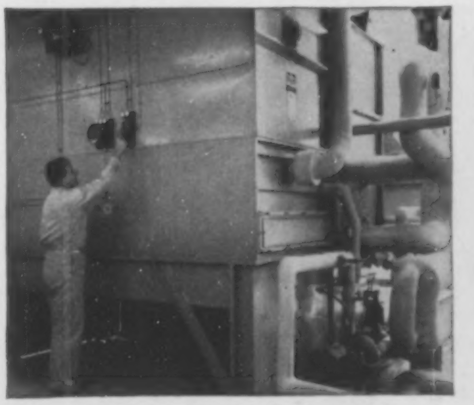
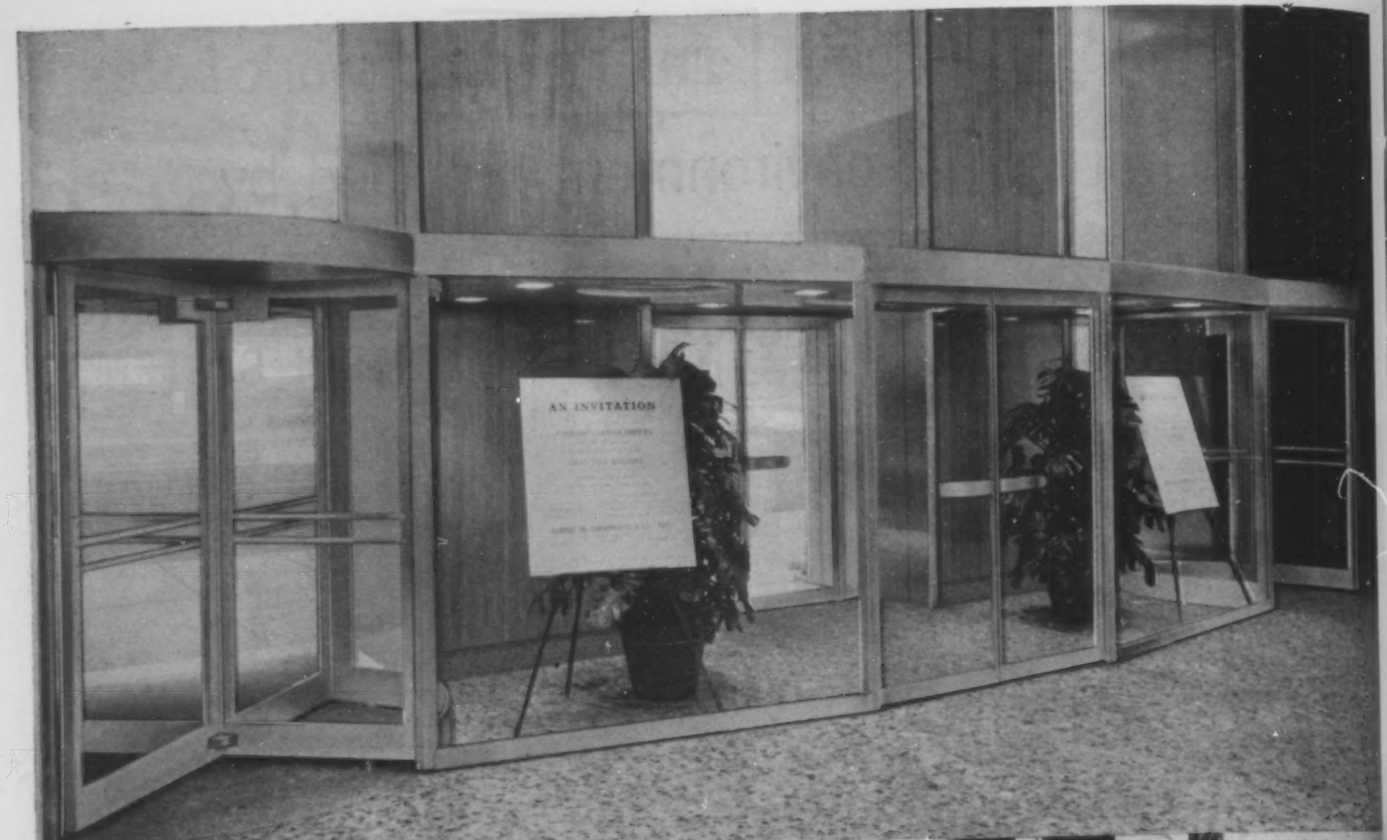




In 4 special SAGE Computer test areas are dehumidifiers (above), a central control panel (right), and dry air coolers (left). On the latter, fluid drive variable speed control is operated by a 6" Powerstroke motor controlled by Powers Static Pressure Regulator and Submaster K Thermostat.

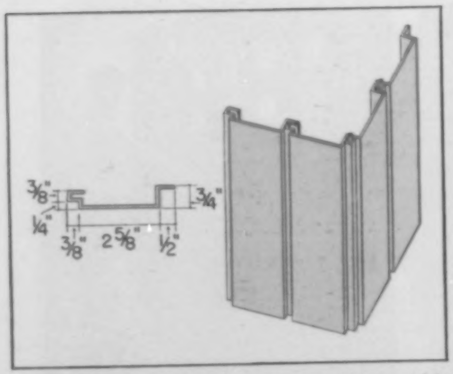
(C-57)



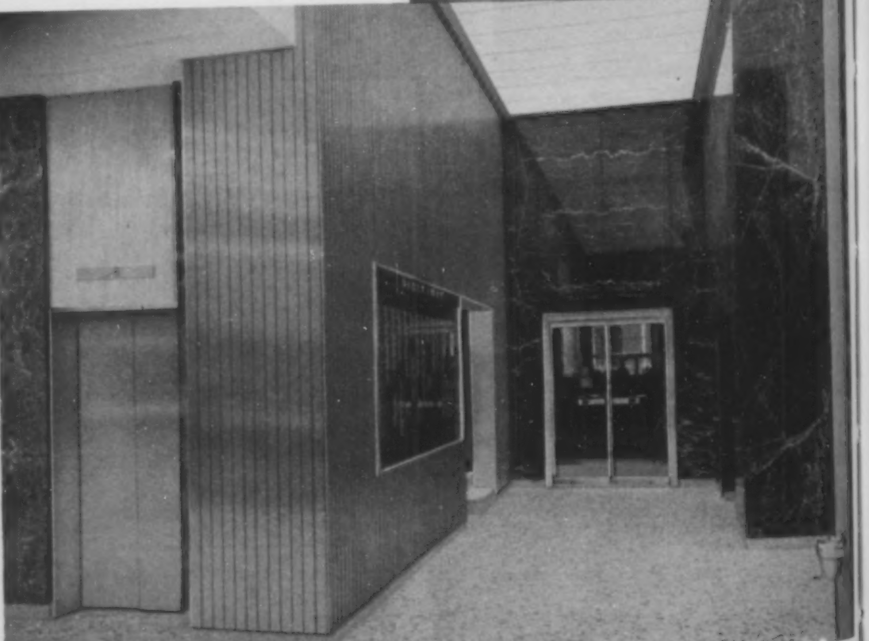
Remodeled Broad St. entrance of Land Title Bldg., Philadelphia, **above.** Bronze sheet and strip frame vestibules and door openings with warm, golden color to complement tans and browns of floor and marble veneer. Dark, closed-in original entrance, **left.**

**Below:** Interlocking bronze extrusions with 3" exposed surfaces form smart, trim panels from floor to ceiling in the main lobby. See diagram below, left. **Right:** The same area as it looked before modernization.

**Architects:** Thalheimer & Weitz, Philadelphia.
**Metal Fabricator:** John G. Leise Metal Works, Philadelphia.
**Elevator Entrances:** W. S. Tyler Company, Cleveland.
**Exterior Doors:** Revolving Door and Entrance Division of International Steel Company, Evansville, Indiana.



**Section and isometric** of bronze extrusions used in wall at right. A metal sub-frame made possible perfect alignment of the shapes. All fastenings are concealed. This special shape was designed and detailed by the architects and the architectural metal fabricator.



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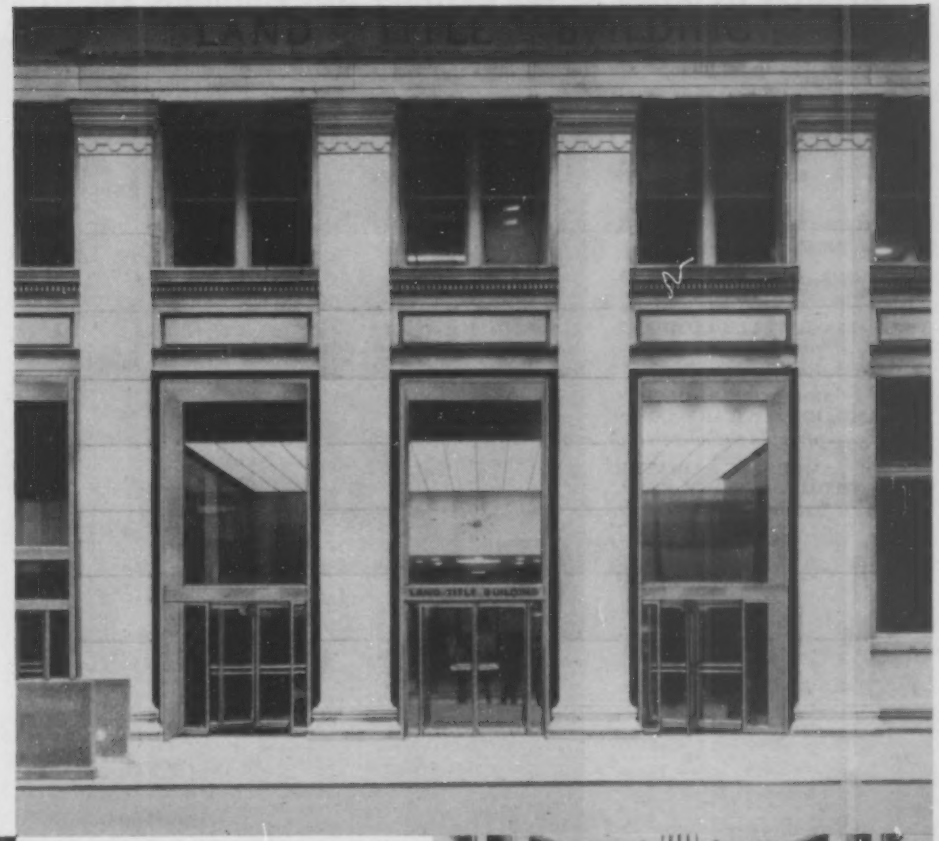
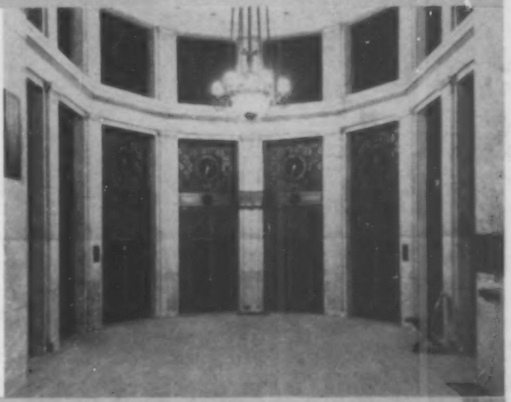
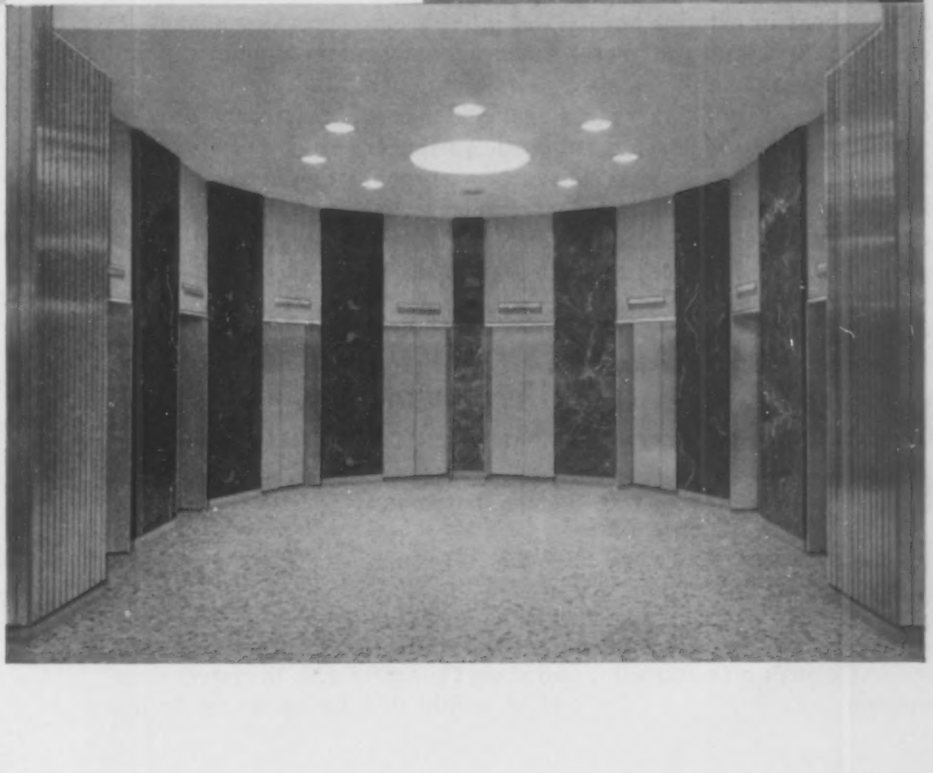


Facade at Broad Street entrance, **above,** was opened and simplified. Bronze sheets surround new door openings, offering an interesting contrast in color and texture with granite masonry. **Left:** The original facade.

**Below:** In the elevator lobby, ceiling was lowered, details simplified. Wall paneling of interlocking bronze extrusions matches in color the bronze elevator doors. **Right:** Original lobby as it appeared just before modernization work started.





A highly favorable reception to the modernized entry is reported by Albert M. Greenfield & Co., rental agents, who write: "We are most pleased with the results achieved in architectural beauty, durability, and low material cost. All of this without impairing the exterior architecture of this long-famous landmark in the heart of Philadelphia." For information on Anaconda Architectural Metals address: Architectural Service, The American Brass Company, Waterbury 20, Conn.

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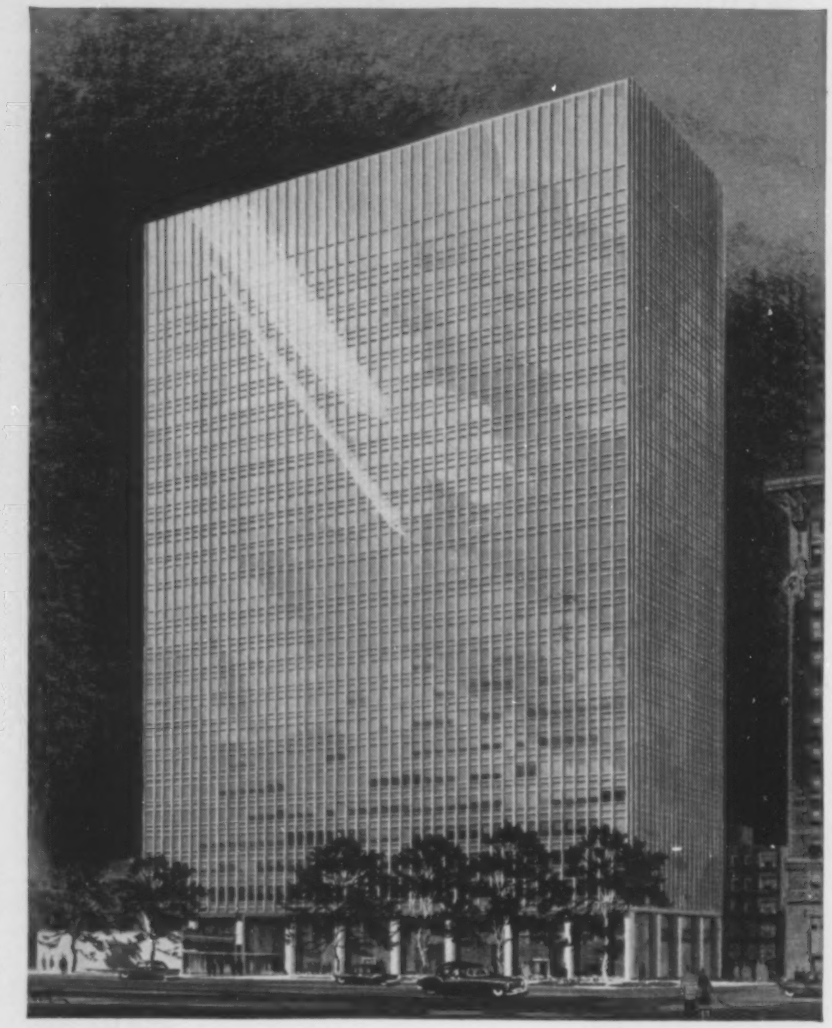

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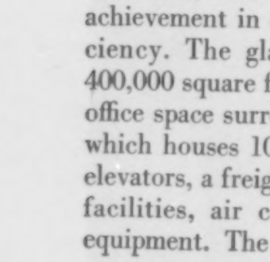

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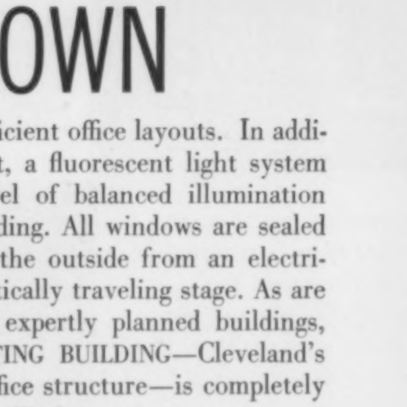

# Eisenhower vetoes harbors bill, signs highway and housing measures; public works given little chance

Construction continues to be the chief weapon the federal government is relying on to combat the recession. Last month efforts to accelerate the volume of new spending for building hit a new peak. President Eisenhower signed the so-called "emergency housing" bill (FORUM, April 1958), and a $1.8 billion measure to swell highway spending, but he vetoed a $1.7-billion "pork barrel" rivers and harbors bill. Meanwhile Congress at mid-month was still debating a $1 billion public works measure. Here are the background details on these important measures to combat the recession:

WALTER BENNETT—TIME

FULBRIGHT

**Public works:** The public works bill, proposed originally by Senator J. William Fulbright (D, Ark.), would give an additional $900 million in loan funds to the Community Facilities Administration (part of the Housing and Home Finance Agency) for loans to localities for building water works, sewer works, sewer systems and a whole range of other public projects. Senate Democrats were unable to ram the bill through determined Republican opposition before the Easter recess. Fulbright's measure won a strong endorsement from former President Harry S. Truman following the recess, but it is doubtful that his support helped the bill's chances much. Republican Senators defeated a move to lower interest rates on loans to localities from 3½ per cent to 3 per cent as part of the Fulbright bill, Republican Senators beat that section of the bill by one vote.

The bill finally passed the Senate, but from earlier Eisenhower statements on the veto of the rivers and harbors and highway measures, it seemed unlikely that the Fulbright bill would get past the President's desk.

**Highways:** The President signed a $1.8 billion measure to raise spending $1.4 billion for the 41,000 mile interstate highway system in the next three years, and $400 million more on the so-called primary and secondary roads. In fiscal 1959, another $200 million will be available for the interstate system, in fiscal 1960, $900 million and in fiscal 1961, an additional $300-million, making a total rise in estimated spending for the interstate system of $1.4 billion. (This is on top of an estimated $5.9 billion to be spent on the interstate system over the next two fiscal years.) The Administration made no bones about its aversion to "crash" programs that would put great pressures on the budget without really giving much immediate aid in the fight against recession. The new highway act, for instance, will, for the most part, finance spending in fiscal 1959 and thereafter, and thus may prove to be an inflationary force rather than be of any real help in combatting the current recession.

Under the new highway act the states will get a break on roads they build that are not part of the interstate system. The new act increases the federal share of building costs for these roads from 50 per cent to 66 2/3 per cent, and authorizes the states to borrow their one-third share from the federal government on short-term loans.

The biggest fight in the highway bill came not over how much money to provide for new spending, but in what to do about billboards. The final act provides for extra payments of ½ of 1 per cent of a state's total highway costs (for interstate roads) if billboards are regulated. (The Dept. of Commerce would set regulations). Actually, the act does not affect areas where billboards already exist, and covers only about 65 per cent of the whole interstate system.

The first state to become eligible for federal payments under the billboard control measure will be Maryland, which passed its own regulation banning billboards within 600 feet of rights of way of all limited access expressways.

**Housing:** President Eisenhower signed the $1.8-billion Sparkman bill "to stimulate residential construction" last month, but not without appending some critical comments. The bill will pump another $1.55 billion into the Federal National Mortgage Assn. for purchase of government insured and guaranteed mortgages. Another $300 million will be used to extend the nearly defunct direct loan program for veterans' housing. The Veterans' Administration home loan guarantee program has also been extended for another two years—it would have died this July. To make the program more attractive to lenders,

*continued on page 8*

the maximum interest rate on VA mortgages was raised from 4½ to 4¾ per cent.

The President hailed some of the act's provisions as "timely additions to our present authorities," but on the whole, he was more critical than laudatory: "The legislation ignores the responsibility and ability of private enterprise to function without imposing a direct burden on the federal purse." He called the $1 billion portion of the $1.5 billion that is earmarked for purchase of VA guaranteed new home mortgages by Fannie Mae at par a "wholly unnecessary burden of up to $1 billion" on the Treasury. He made another plea for VA interest rates that are "fully adjusted to actual market conditions."

It is by no means certain how much new building the housing act will stimulate. Mortgage credit has already eased considerably—by mid-April the conventional mortgage rate had dropped from the 1957 peak of 6 to 6½ per cent to about 5½ per cent—and this act simply makes a little new credit available. But lenders say there still is not much mortgage money available at 4¾ per cent, so many of them do not believe the higher interest provisions on VA mortgages will help much until interest rates generally fall further. And that may not happen until too late to stimulate much construction in the peak home-building months this year.

John M. Dickerson, executive director of the National Association of Home Builders, is more hopeful. He says that the new act, plus the President's action a week later in removing the 2 per cent down payment requirement on VA mortgages, was "a major step in the nation's economic recovery drive." He estimates that it will mean at least 100,000 new housing starts this year. (Senator Sparkman himself figured the act will add 200,000 starts, and Housing and Home Finance Administrator Albert M. Cole says it could add 150,000 starts.)

The Administration may make its dissatisfaction with the act felt by holding back some of the funds authorized by Congress. Up to June 30, Fannie Mae will probably only get $300 million of the total $1.5 billion available, and after that, the volume of mortgage purchases can be scaled to any spending level the Administration desires. In coming months, the money managers will have to steer a perilous course between budgetary pressures and demands for home mortgage credit expansion.

PUBLIC BUILDING

## Lease-purchase of federal office buildings halted, but Post Office plans a $40 million program

The federal government's lease-purchase program for building multipurpose federal office buildings was one step nearer extinction last month. The House of Representatives voted to shift to a direct payment basis for the building of 66 projects that had already been earmarked for lease-purchase. The argument that most convinced the congressmen to discontinue the lease-purchase method, wherein the federal government leases buildings built with private funds and eventually takes over such buildings when the amount paid in rent equals construction and interest costs, is that direct payment is only about half as expensive. To build the 66 buildings under lease-purchase would cost $348 million, whereas it would only cost $177 million to pay for the buildings outright. (What this dramatic comparison fails to take into consideration, of course, is the interest cost of $177 million of additional deficit financing.)

The chief argument in favor of lease-purchase has been that it takes pressure off the budget. By buying "on time" the government can avoid spending large sums for construction at one time. The Eisenhower Administration has favored the program, but Congressional Democrats and some Republican economizers have consistently opposed it as being unnecessarily expensive. Last year, Congress refused to extend the program, technically killing it. But there were already 96 projects planned, and these have gone ahead. The latest House action takes more than two-thirds of those projects out of the lease-purchase program by simply appropriating funds to build them directly.

The General Services Administration, which guides lease-purchase, says it will continue under that program with six projects already under construction and another 29 projects in various stages of bidding, including some that are included in the 66 buildings which have been voted direct appropriations. But GSA cannot contract for any further lease-purchase buildings after July 1 The House Appropriations Commit-

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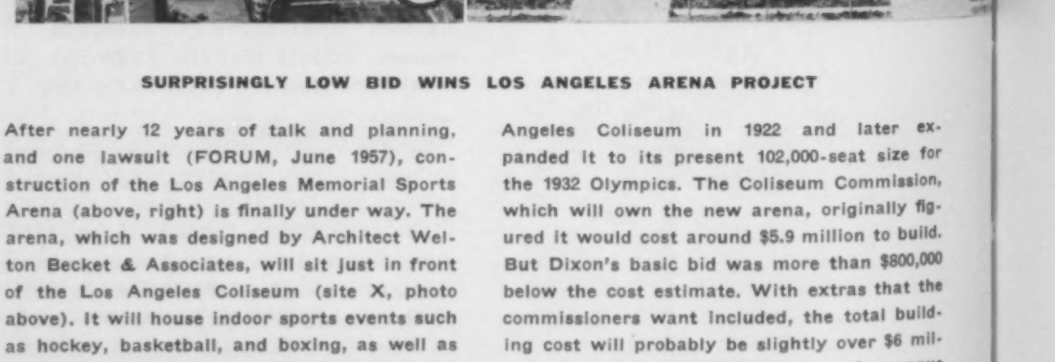
VANGUARD PHOTOGRAPHY



**SURPRISINGLY LOW BID WINS LOS ANGELES ARENA PROJECT**

After nearly 12 years of talk and planning, and one lawsuit (FORUM, June 1957), construction of the Los Angeles Memorial Sports Arena (above, right) is finally under way. The arena, which was designed by Architect Welton Becket & Associates, will sit just in front of the Los Angeles Coliseum (site X, photo above). It will house indoor sports events such as hockey, basketball, and boxing, as well as trade shows. Maximum seating will be 30,000, but about 15,000 to 19,000 will be the peak audience for sports events.

A surprisingly low bid won the contract for the job for Contractor Lucius Earl Dixon of San Gabriel. It was Dixon who built the Los Angeles Coliseum in 1922 and later expanded it to its present 102,000-seat size for the 1932 Olympics. The Coliseum Commission, which will own the new arena, originally figured it would cost around $5.9 million to build. But Dixon's basic bid was more than $800,000 below the cost estimate. With extras that the commissioners want included, the total building cost will probably be slightly over $6 million. Last month, $7.8 million of revenue bonds were sold to finance the project. Dixon has said that he wanted to build the arena, "even if I lose money," which some competitors think he may do. The arena is scheduled to be finished in about 15 months.

tee had requested GSA, and the Bureau of the Budget, which must approve all lease-purchase contracts, to discontinue making lease-purchase contracts a few months ago. But Budget Director Maurice Stans approved some additional projects, and thereby precipitated the latest action. If the Senate goes along with the House action, there will be no further lease-purchase contracts after July 1.

Meanwhile, the Post Office Dept., which can build post offices under its own lease-purchase program, as long as the buildings are used only for postal facilities, announced it was proceeding with a $40 million program to build and lease 905 new post office buildings throughout the country. Postmaster General Arthur Summerfield, in announcing the program, said it would "improve local real estate, and provide hundreds of thousands of jobs and be a stimulus to the economy of the nation." The only federal money that would be spent in the program would be for the equipment that goes into the post offices. Funds for construction would have to come from private sources, who would in turn lease the buildings to the government.

### LAW

## Builder loses libel suit against city official

Architects and builders who are criticized by public officials for work done on public projects will just have to grin and bear it—at least in Pennsylvania. A few weeks ago, the Pennsylvania Supreme Court upheld a lower court decision that in effect said it was a public official's duty to criticize a contractor's work on a public job, and the contractor has no recourse in the law to sue because of such criticism.

The case arose last year when two Philadelphia officials, City Architect George I. Lovatt and Deputy Public Property Commissioner William T. Genetti were quoted in a local newspaper as criticizing a local construction firm for not following specifications. Their failure to do so, according to the officials, had resulted in needless delays on two public buildings.

The contractor sued the city officials, charging them with willfully making libelous statements affecting the contractor's reputation. The Court of Common Pleas dismissed the suit on the grounds that the city officials were privileged in making statements in connection with their official duties.

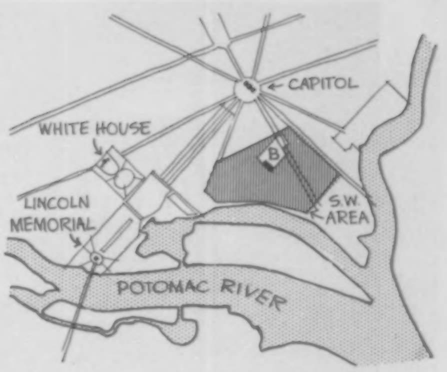
The contractor's attorney took the case to the State Supreme Court, and suffered another setback. The court said: "The public interest demands that these city servants . . . be encouraged to inform the community of the progress or lack of progress of important public works paid for by the taxpayers. Further, the public has legitimate concern with the reasons, if any, for apparently unreasonable delays in performance of city contracts."

City Solicitor David Berger, who represented the city in opposing the suit, commented: "For the first time it has been established that city officers may freely make statements in order to keep the public fully informed regarding city activities without fear of facing court action for alleged libel."

### URBAN RENEWAL

SCHEUER (L.) AND STEVENS

## Washington, D.C. redevelopment gets under way



The rebuilding of the "slums in the shadow of the U.S. Capitol" finally got under way last month with the groundbreaking ceremonies for the first apartments to be built in Washington's so-called Southwest Area "B." The site has been cleared for nearly three years, but administrative delays in FHA and other government agencies have held actual work up until last month. Developers Roger L. Stevens and James H. Scheuer plan to build two eight-story luxury apartment houses, and garden-type town houses, comprising a total of 1.020 units, on the 29-acre site. The project will cost $15 million (including land). The high-rise apartments, to be called "Capitol Mall Towers," will cost $6 million. Rents will range from $100 per month for efficiency units to $197 for two-bedroom units. The apartments, all air conditioned, are largely financed by an FHA-insured mortgage of $4.5 million.

A feature of the luxury project will be the large, open green spaces being designed by Landscape Architect Dan Kiley, of Charlotte, Vermont. Many of the existing trees were saved in the clearing of the site. The buildings themselves were designed by Nicholas Satterlee and Mrs. Chloethiel W. Smith of Washington.

The first two buildings of the project are scheduled for completion by summer of 1959, and the shopping center and other elements of Area "B" shortly afterward.

### PUBLIC HOUSING

## Public housing woes continue to pile up

Public housing, with an already stormy history, was bouncing on a new sea of troubles last month. In Chicago, a recent report of the federal Public Housing Authority has stirred up another hornets' nest in an already scandal-ridden local housing authority. The report charged that nearly $1 million a year is being spent in wasteful practices, including feather-bedding by union labor, and in repairing tenant vandalism.

Meanwhile, in St. Louis, the housing authority has been forced to file 390 eviction suits for nonpayment of rents,

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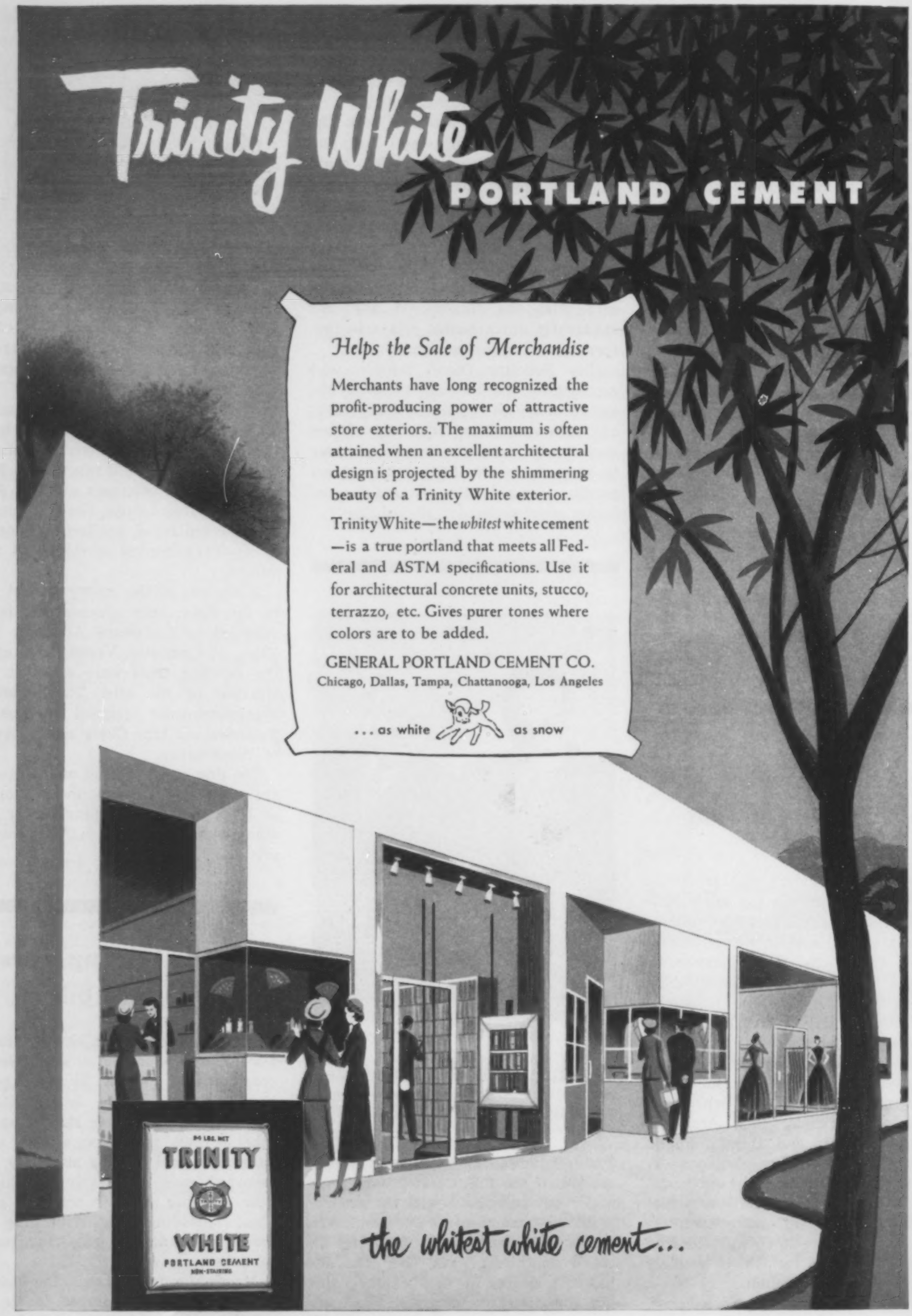
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a situation which it attributes to the heavy unemployment in the area. St. Louis has also been hard hit by tenant vandalism, but housing officials say this situation is getting better. In New York, where the housing authority is in the midst of a reorganization, two of the most influential newspapers in the U. S. criticized the whole philosophy of public housing as presently administered.

The *New York Times* attributed much of New York's juvenile delinquency and other crimes to bad social conditions in public housing developments. The *Times's* veteran foreign corresponsdent, Harrison Salisbury, wrote: "Nowhere this side of Moscow are you likely to find public housing so closely duplicating the squalor it was designed to supplant." The *Wall Street Journal* editorially called the present state of public housing "a social mess at least as bad as when the program was launched."

Public housing is also having some financial troubles. Widespread vandalism and rising operating costs, which are only partially defrayed by federal subsidy, have pushed some authorities into the red. Already PHA is considering what steps it might take if more housing authorities begin incurring big deficits, as Chicago and other authorities have done lately. PHA could loan local authorities funds, demand that the cities or states put more money into the authorities, or eventually take over the operation of local authorities, itself.

The new torrent of criticism, and latest reports on the economic woes of public housing, come at a time when solutions for many of the program's most obvious troubles are being discovered. A few months ago, in Cedartown, Georgia, the first detached-dwelling-unit public housing on small, scattered sites was opened, setting the stage for an ultimate break away from the high-rise project approach. In Philadelphia, a program to rehabilitate existing row-house units for use as public housing is now under way. And more thought is being given in Congress to allowing tenants gradually to purchase the units they live in, a proposal that has been advanced by many of the people who have done the most thinking about the program (FORUM, May, June 1957). As one long-time observer of public housing commented last month: "It would be a pity if this latest rash of critical comment detracted from the very real progress just being made. The recent experiments prove that the basic program can be saved, if we work hard enough to save it."

ARCHITECTURE

J. E. MYERS

NEUTRA

ROBERT R. BLANCH

ALEXANDER

## Architects stymied in fight to obtain fees from Guam: island cannot be sued

Guam is a little-known chunk of Pacific coral that would probably not be known at all but for World War II. The war touched it briefly, but by 1944 had moved westward, and Guam settled down to become a major U.S. naval and air base. Today, it sits peacefully in the mid-Pacific, nearer by 3,500 miles to Manila than to San Francisco. It is still controlled by the U.S. (it is an unincorporated territory), as it has been since 1898 when this country took Guam from Spain. Its chief distinction is that it is one of the principal Pacific bases of the Strategic Air Command.

To Richard Neutra and Robert E. Alexander, California architects, Guam is neither little-known nor peaceful. They have lived through seven years of stormy dealings with Guam governors, the U.S. Department of Interior and various U.S. congressmen. To them, Guam is synonymous with confusion, obfuscation and frustration. Neutra, at 66 one of the grand old men of American architecture, has just thrown up his hands over the whole mess. His younger associate, Alexander, has been handling the mass of correspondence and paperwork involved in their seven-year long battle with Guam.

Specifically, Neutra and Alexander are trying to get $82,267.74 in back architectural fees which they claim the Territory of Guam owes them. Complicating their problem is the fact that Guam, unlike most governmental entities, cannot be sued—it is immune from suit according to the 1950 Organic Law of Guam, which can only be changed by the U.S. Congress. Thus Neutra and Alexander are stuck unless the present governor changes his mind and pays the tab, or unless Congress changes the Organic Law of Guam to permit suit in breach of contract cases.

Neutra and Alexander were first called to Guam in 1951 by the island's first postwar governor, Carleton Skinner, who wanted to build Guam into a self-sustaining community. Neutra and Alexander were given a contract to design a master plan for Guam, including streets, schools, building codes, and a new governor's palace. About a year later the master plan, calling for development over a ten-year period, was finished.

But from 1952 on, things got rougher and rougher. Skinner was replaced by a new governor, Ford Q. Elvidge. Neutra and Alexander were finishing supervision of construction on the first part of the governor's palace. This was a low-budget job, with only about $108,300 available, but plans called for later additions to the building. However, Elvidge would not pay Neutra and Alexander a fee based on the full $108,300. He would only allow a fee based on what he said was the portion spent on "the design by Neutra and Alexander." This came to $73,809, Elvidge said. Following this contretemps, Alexander filed a claim with the governor for an additional fee of $3,499.10. Elvidge refused to pay it, finally said that Guam really owed the architects $1,103.39, and sent Alexander a check for that amount.

By this time, Alexander had called in

*continued on page 13*

## NEW

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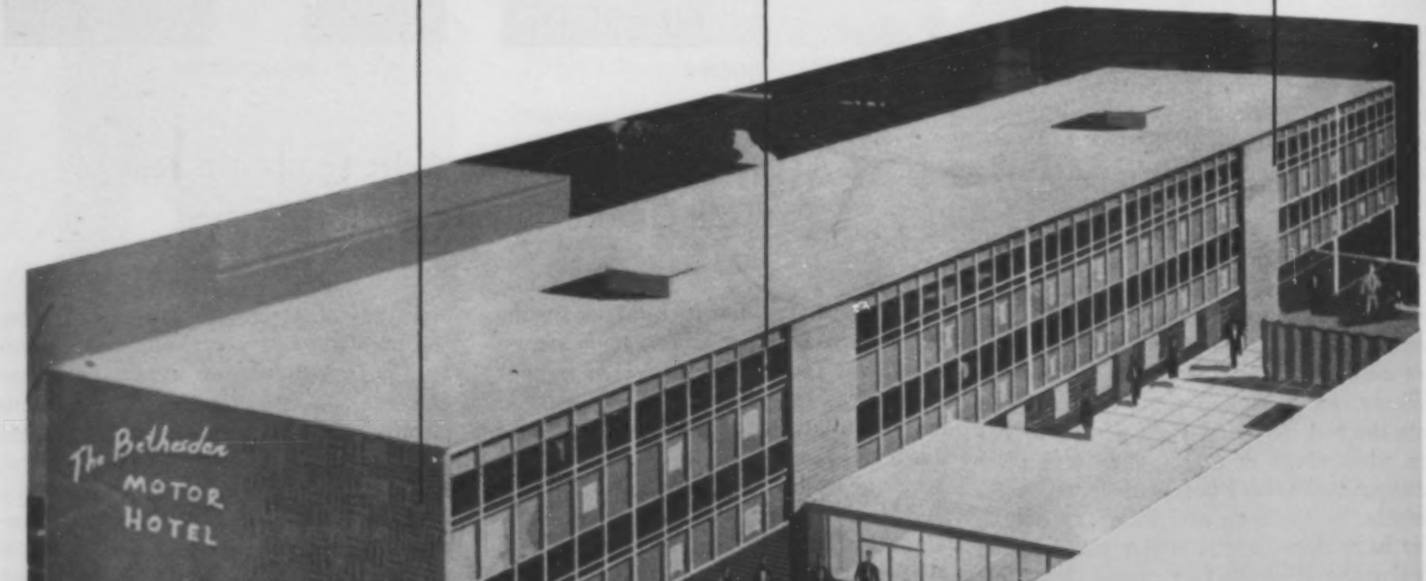

BETHESDAN MOTOR HOTEL: Architect—John F. Stann, Rockville, Md.
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a lawyer, who advised that the check not be cashed, as to do so would make it appear the architects were satisfied with the settlement.

The battle between Guam and the architects got still hotter when Neutra and Alexander were given a contract to proceed with construction of three elementary schools and a high school, according to their own master plan. They received their full fee for the first elementary school, but then the Guam government canceled one of the other schools, and said that the government would build this school itself, without the architects' supervision.

The final blow came after Neutra and Alexander designed a $2.5 million high school, for which they say they should have been paid a fee of $200,000 or 8 per cent. Elvidge then canceled this contract, and the architects pared down their claim to only $68,400, based on their original contract for the building.

For a year after this, Alexander pressed the firm's claims, which by this time totaled $82,276.74, but Elvidge ignored them. Alexander's lawyer could not even get recognition as the architects' legal representative on Guam. An appeal to the Department of Interior failed, because, although that department technically has jurisdiction over Guam, the island has its own legislature, and has legal sovereign status.

Even Elvidge's departure as governor in 1956 did not help Alexander's case. The new, and present, governor, Richard B. Lowe also denied their claim, and finally Alexander decided to go right to the top. In April 1957 he wrote to President Eisenhower outlining his grievances against Guam, and months later the White House replied three months later the White House replied that the matter was being turned over to the Department of Interior. Alexander had come full circle.

But Alexander patiently began conferences with the Department of Interior, and the department said it would study the matter further. To speed such study, Alexander wrote to Senator Thomas Kuchel (R, Calif.) outlining his problem, and Kuchel eventually agreed to sponsor legislation in the Senate that would allow suits to be filed against territories such as Guam. This was two months ago, just about seven years after the filing of the architects' first claim against the sovereign territory of Guam.

As it stands now, Neutra and Alexander can only hope that Congress comes to their rescue. Meanwhile, Guam stretches its 30-mile length full in the Pacific sun, turning a face of peace to all save the architects.

## Sixth Hilton hotel abroad opens in Havana

Fitful revolutionary outbreaks in Cuba last month could not suppress the gaiety surrounding the opening of the newest Hilton International hotel, in Havana. The 30-story Havana Hilton, designed by Welton Becket & Associates, is called the "largest and tallest building in Latin America" by hotel tycoon Conrad Hilton. The $24 million hotel will be operated by Hilton Hotels International, but is owned by Cuba's Catering Workers Union. The 630-room hotel, located in the middle of Havana's business district, has an excellent view of the bay—at $50 to $60 a day for a one-bedroom suite.

HAVANA HILTON

Major attractions at the new hotel are a courtyard with a flavor of Spanish luxury, including an old-world fountain, coupled with a modernistic mosaic façade, by Amelia Peláez, that dominates the entire block-long entrance to the hotel.

**BALTIMORE'S $127 MILLION DOWNTOWN REDEVELOPMENT**

**Refusing to take a back seat to Fort Worth, Pittsburgh, or any other city that has undertaken ambitious redevelopment of central business areas, Baltimore last month announced a $127 million urban renewal program that is calculated to revitalize its shabby downtown area. The project, called Charles Center, would cover 22 acres in the heart of the city's downtown, midway between the major shopping and office building areas. The nine-block area would be cleared except for five large buildings, and then eight new buildings would be erected, according to the plan of the Planning Council of the Greater Baltimore Committee, Inc. One of the new buildings would be a federal office building (at far end, above), another an 800-room hotel adjacent to the present Lord Baltimore Hotel. There would be five new office buildings and a new 3,000-seat theater for plays and television.**

BUSINESS

## Astor Plaza loses an Astor and a plaza

Just about everybody concerned was keeping mum, but by last month it was obvious that Manhattan's Astor Plaza project would have neither an Astor nor a plaza.

Vincent Astor, who had originally planned to build a Park Avenue office building skyscraper fronted by a broad plaza adjacent to the Seagram building and across Park Avenue from Lever House, sold his interest in the site to the First National City Bank of New York. No prices were announced—Astor did not own the land itself, but he had a lease on it, and had paid for partially clearing the land. Astor, who presumably lost money on the sale, had trouble getting long-term financing some months ago, and then reportedly ran into opposition to the project from English members of the Astor family, who control the lease on the property.

*continued on page 14*

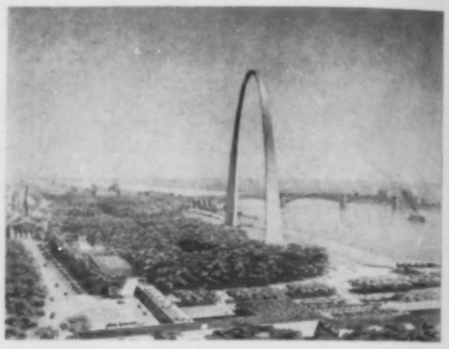
The First National City will keep its present headquarters in the Wall Street area, but plans to move most of its mechanical operations into the building it will build on the Astor Plaza site. However, its plans, while still not formally announced, will definitely not include a plaza in front of the building. The bank is expected to build only 36 stories high, instead of 46 stories as Astor had planned, and the bank's management says that its plan is "not the same at all" as the original Astor plan.

The first Astor plaza building was designed by Architects Carson & Lundin. Although they have not been formally hired by the bank, it is expected that they will be, for the bank has not asked them to stop work on the plans.

It is also expected that the bank will require a much bigger building than Astor had planned. Even though it will be lower, it may have as much as 250,000 square feet more floor space. Most of the space will be occupied by the bank itself.

The bank is understandably reluctant to discuss the project because it is in the peculiar position of being both a party to the transaction and an agent for the English branch of the Astor family. City Bank Farmers Trust, a subsidiary of First National City, is trustee for the Astor estate.

DESIGN



## Saarinen's St. Louis arch project finally approved

After many months of shilly-shallying, and changes of mind as well as changes of plan, the Jefferson Memorial project for St. Louis' Mississippi waterfront was near to getting underway last month. Officials of the Terminal Railroad Association, which leases the right of way, finally approved a revised plan for the relocation of tracks that are now elevated on the site of the proposed memorial, which is to be highlighted by Architect Eero Saarinen's soaring 600-foot stainless arch. Saarinen had to change his original plan for the second time.

The latest snag over track relocation came three months ago when the Terminal Railroad Association suddenly upset an agreement it had made last November with the city and Saarinen. Then, it had agreed to a revised plan calling for a tunnel 1,260 feet long with open cuts at either end, the total relocation bill coming to $5.3 million. Earlier, it had balked at a $14 million plan calling for a 3,000-foot-long tunnel. In February, however, the railroad announced it was not studying the question of allocation of cost for this plan, but rather was studying a new plan to have the tracks run along the surface. This would cost only $1 million, but future visitors to the park, and those who ascended the elevator inside the arch, would be afforded a view of trains and tracks more

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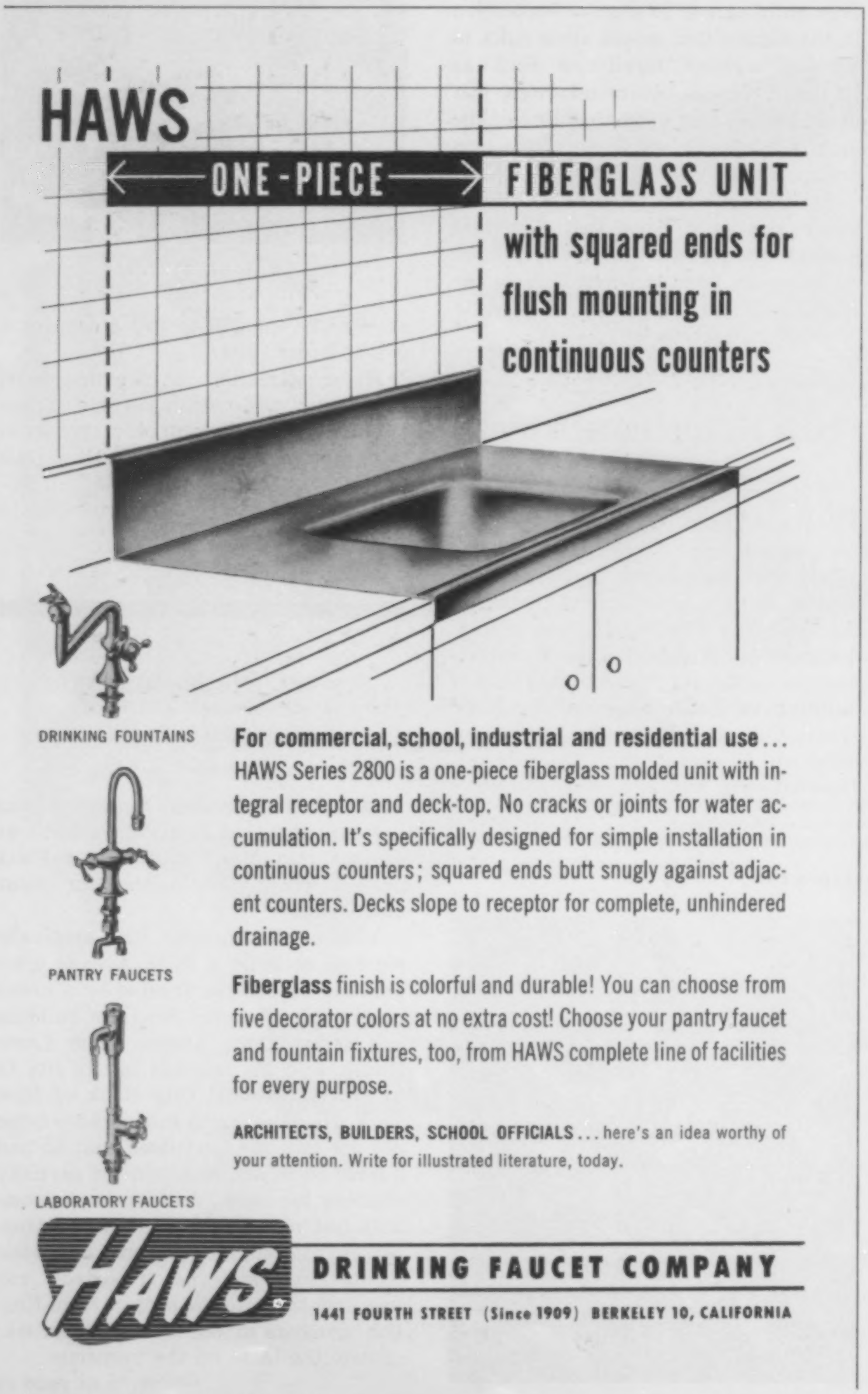
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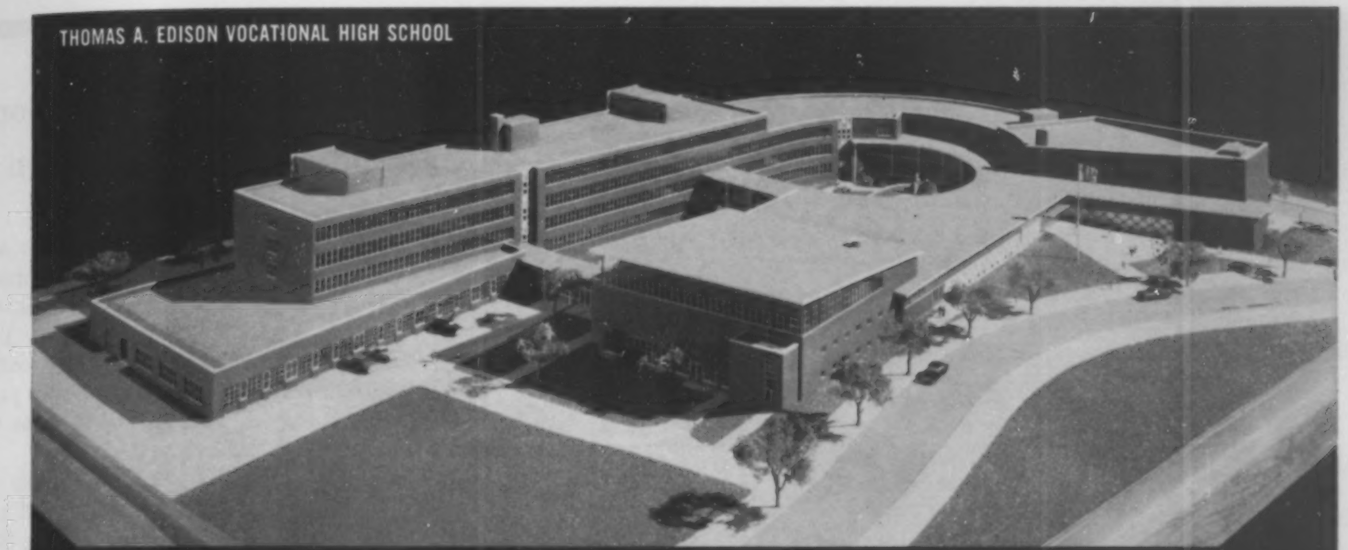
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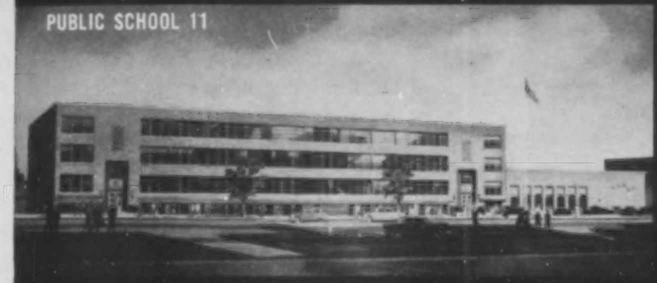
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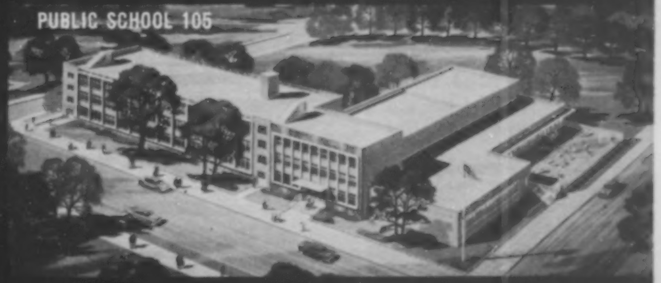
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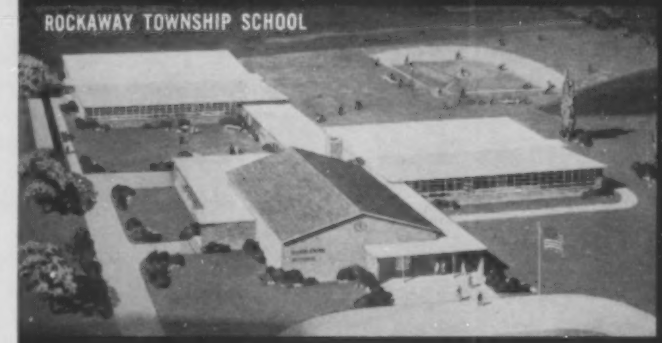
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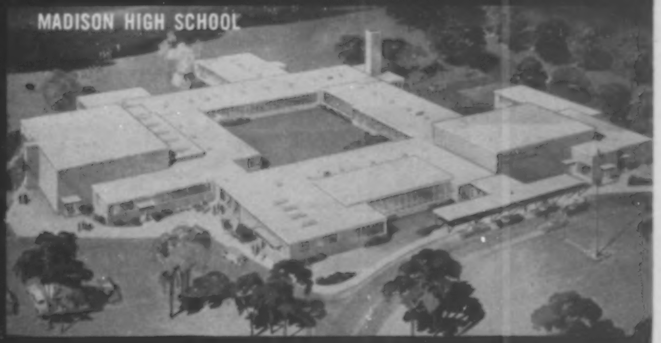
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Architect: H. I. Feldman, New York, N. Y.
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**FABRICATION IN ALUMINUM—STAINLESS STEEL and COATED STEEL**

than of river and park greenery.

Saarinen finally came up with a second compromise about six weeks ago. This called for a still shorter tunnel—about 960 feet—with longer open cuts at either end to be shielded by trees and shrubs. He figures the total cost for this plan at $2.9 million, and shortly after its announcement, the city and the railroads announced they were in complete accord on accepting the plan. The railroad will pay $500,000 of the cost, the city around $578,000. The federal government has already appropriated $1.8 million as its share of track relocation at the new national park, and has set aside another $788,000 for developing the surrounding park areas as well.

Understandably cautious after long delays, city officials now are hopeful that the new arch and park can be completed by the year of the city's 200th birthday—1964.

WASHINGTON

## East Front extension draws new opposition

A growing chorus of experienced and well-known architects and historians spoke out against the controversial extension of the East Front of the U.S. Capitol last month, drowning out a well-known nonarchitect—former president Harry S. Truman—who came out in favor of the extension.

Truman spoke up to bolster the position of his old political crony of yesteryear, Speaker of the House Sam Rayburn, who has made the extension his pet project. In his usual harum-scarum fashion, Truman told a Washington lunch group, "You can do as you damned please, but I'm going to urge Rayburn to finish this thing while the Capitol is still standing." But Truman was repudiated by Rayburn's own aide-de-camp, Architect of the Capitol, J. George Stewart, who was forced to admit that the Capitol was not in danger of collapsing at all.

While Congress still was debating the issue of extension in the cloakrooms rather than on the floor, a new chorus of opposition to extension swelled up. Critic Lewis Mumford called the proposal "an act of desecration that should be resisted." Siegfried Giedion, well-known Swiss lecturer on architecture at Harvard, said, "Do what you will, but don't touch the east façade of your national shrine. The Capitol is without doubt the best government building erected during the nineteenth century. . . . The extension of the East Front would be an architectural crime."

Paul Rudolph, new chairman of Yale University's department of Architecture (FORUM, April 1958), says bluntly: "It [the proposed extension] ruins the relationship of the façade to the dome, and you don't get much more space. . . ." Architect Eero Saarinen said the extension would result in "an inverted pot [the dome] sitting on the whole structure . . . the dome loses its significance."

Dean William W. Wurster of the University of California's college of Architecture, sums up the feelings of many well-known professionals: "The sponsors of the change seem to have acted in a very prejudicial way, moving ahead with preconceived notions rather than trying to seek esthetic solutions. It would seem that political considerations are being given precedence over architectural ones."

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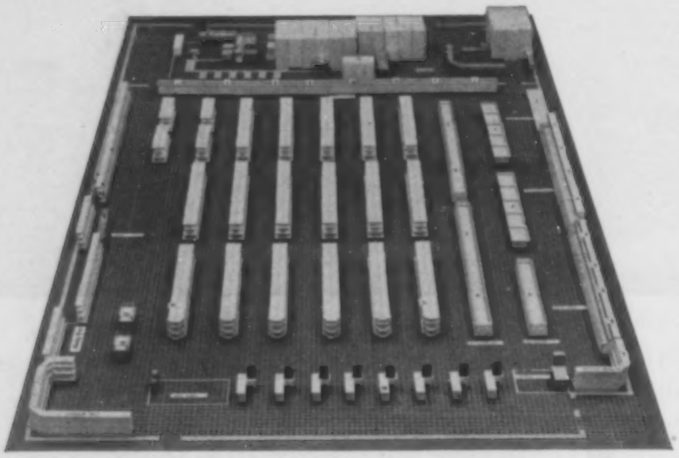

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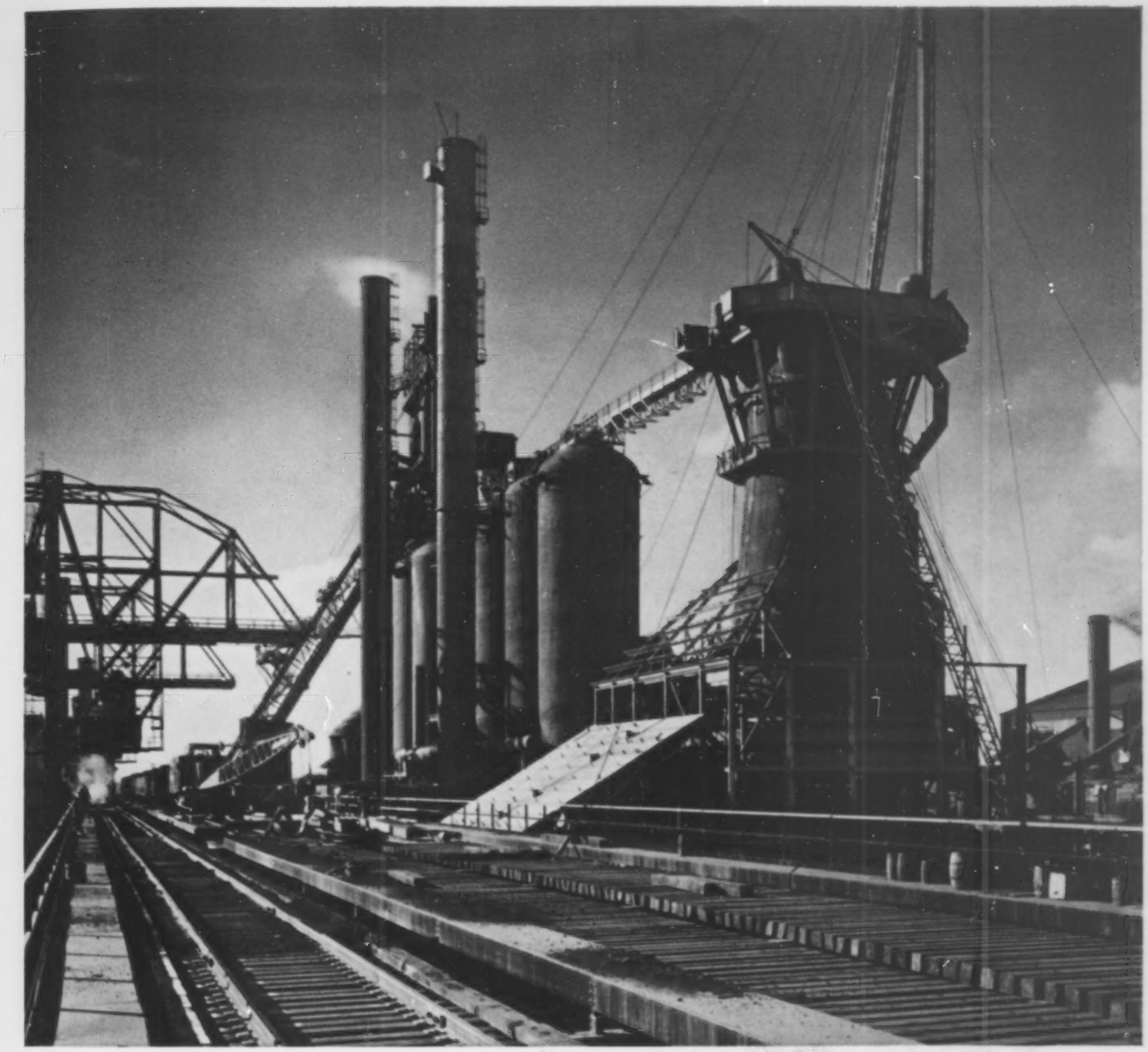

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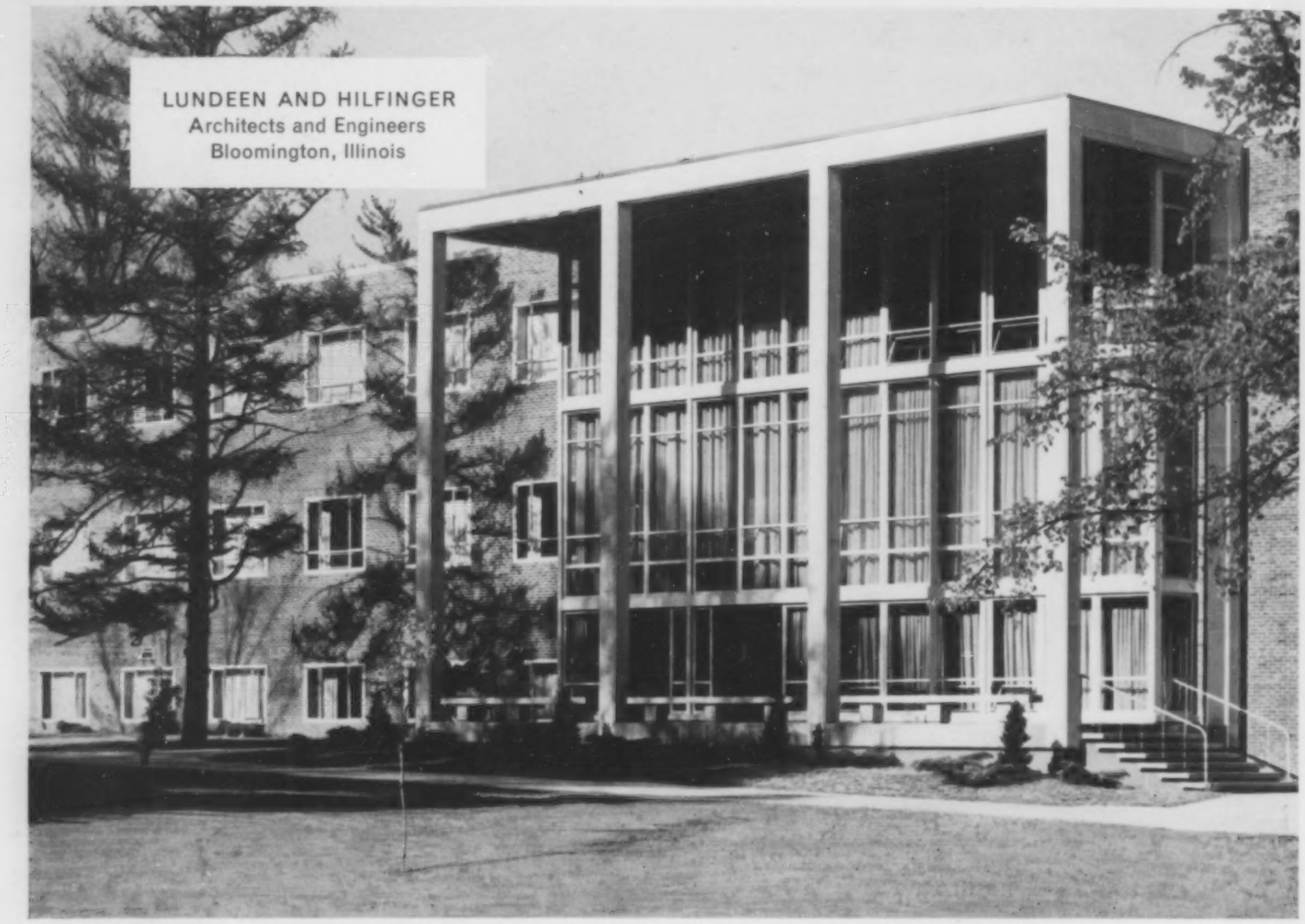
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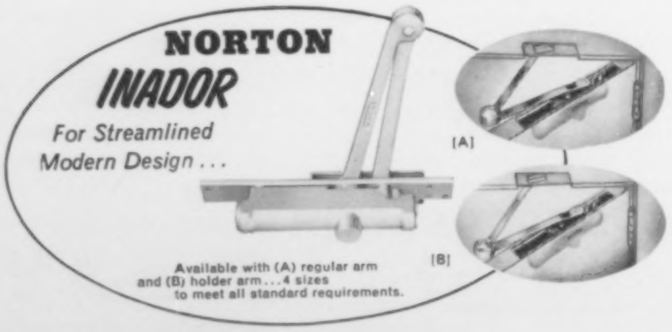
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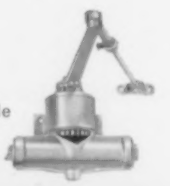

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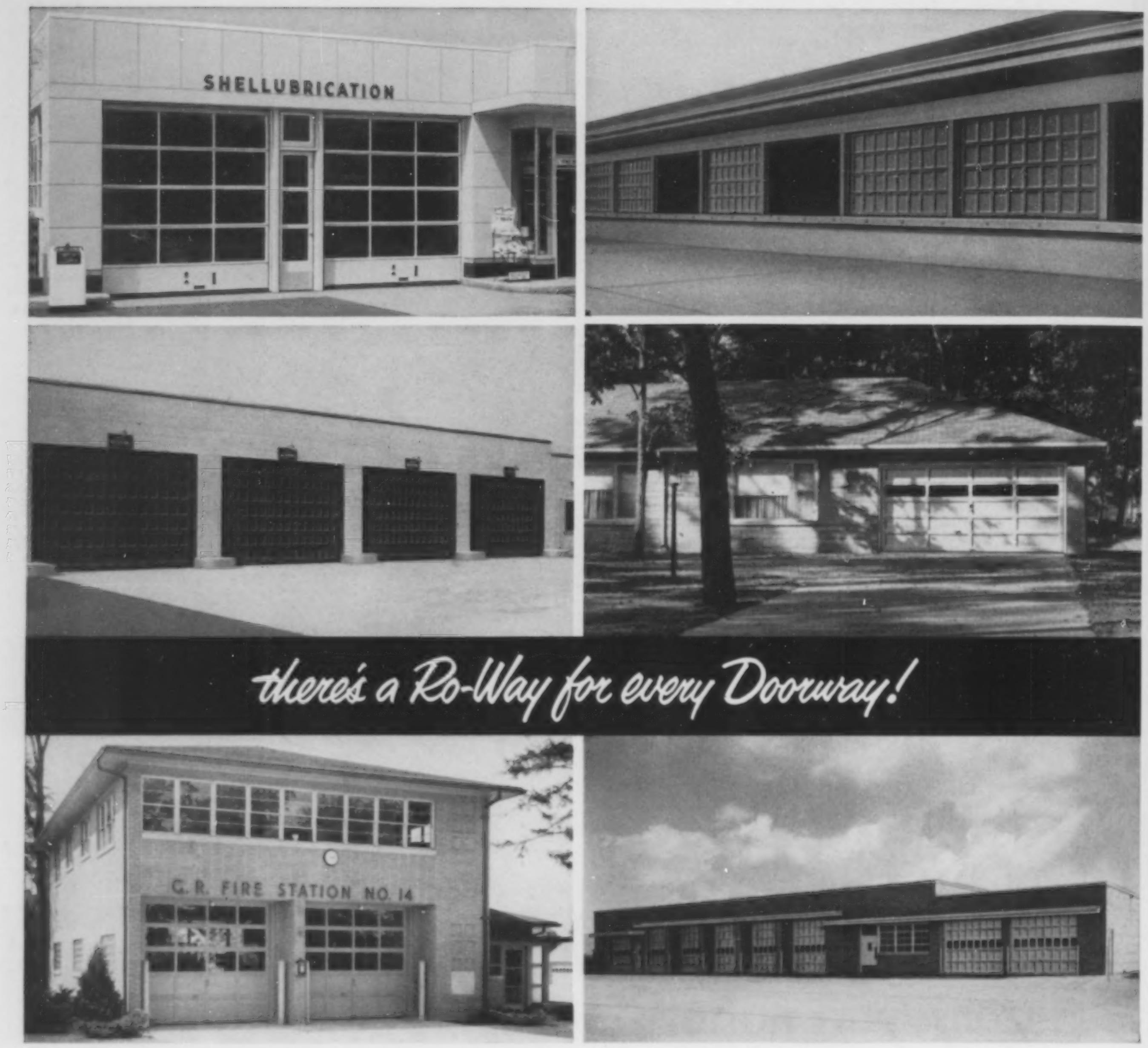

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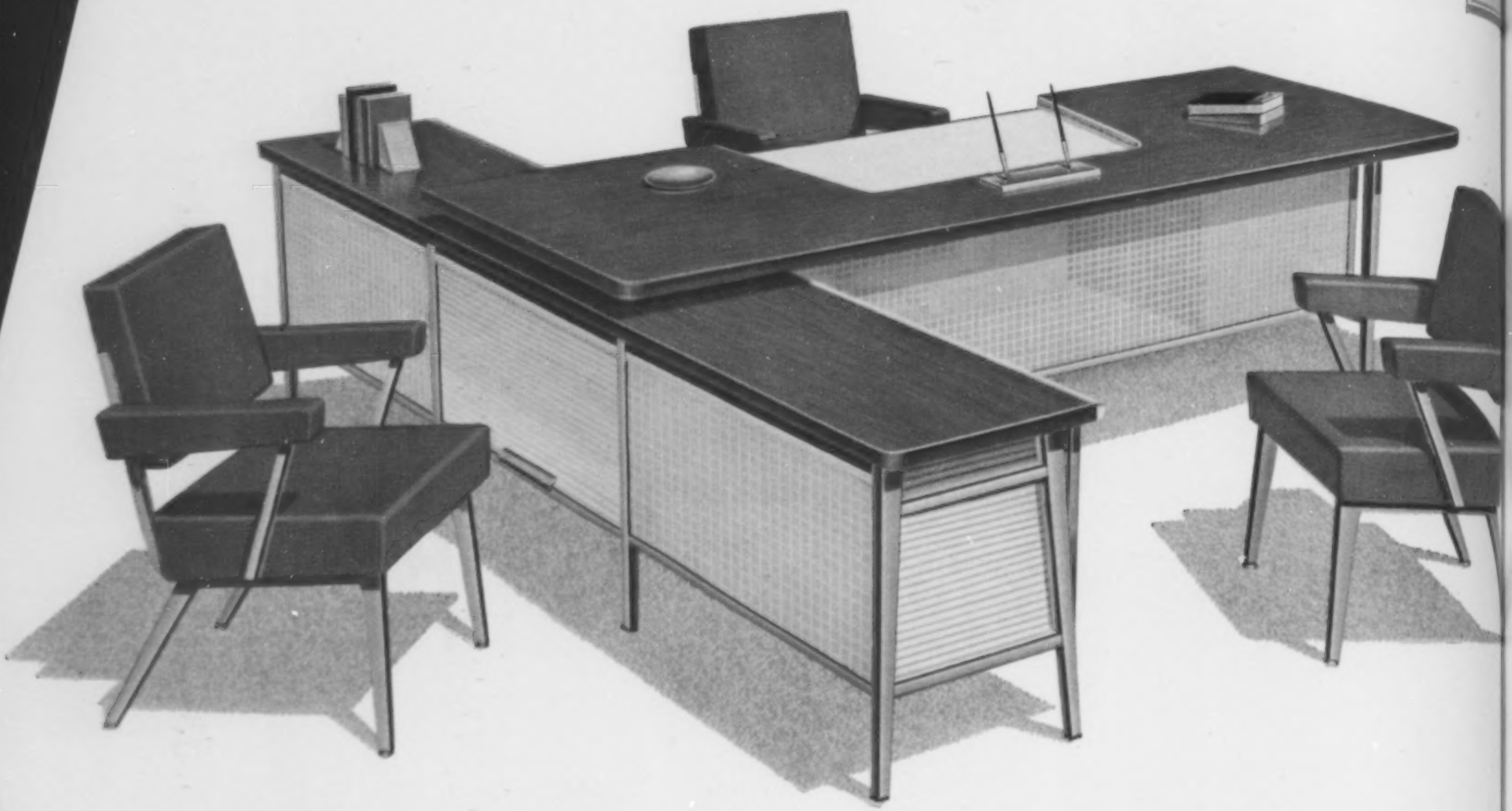

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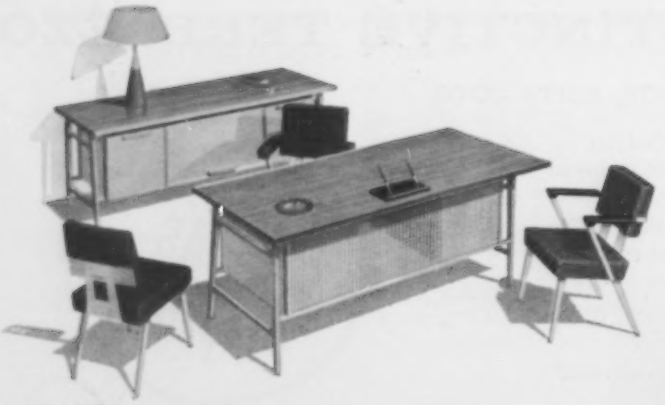

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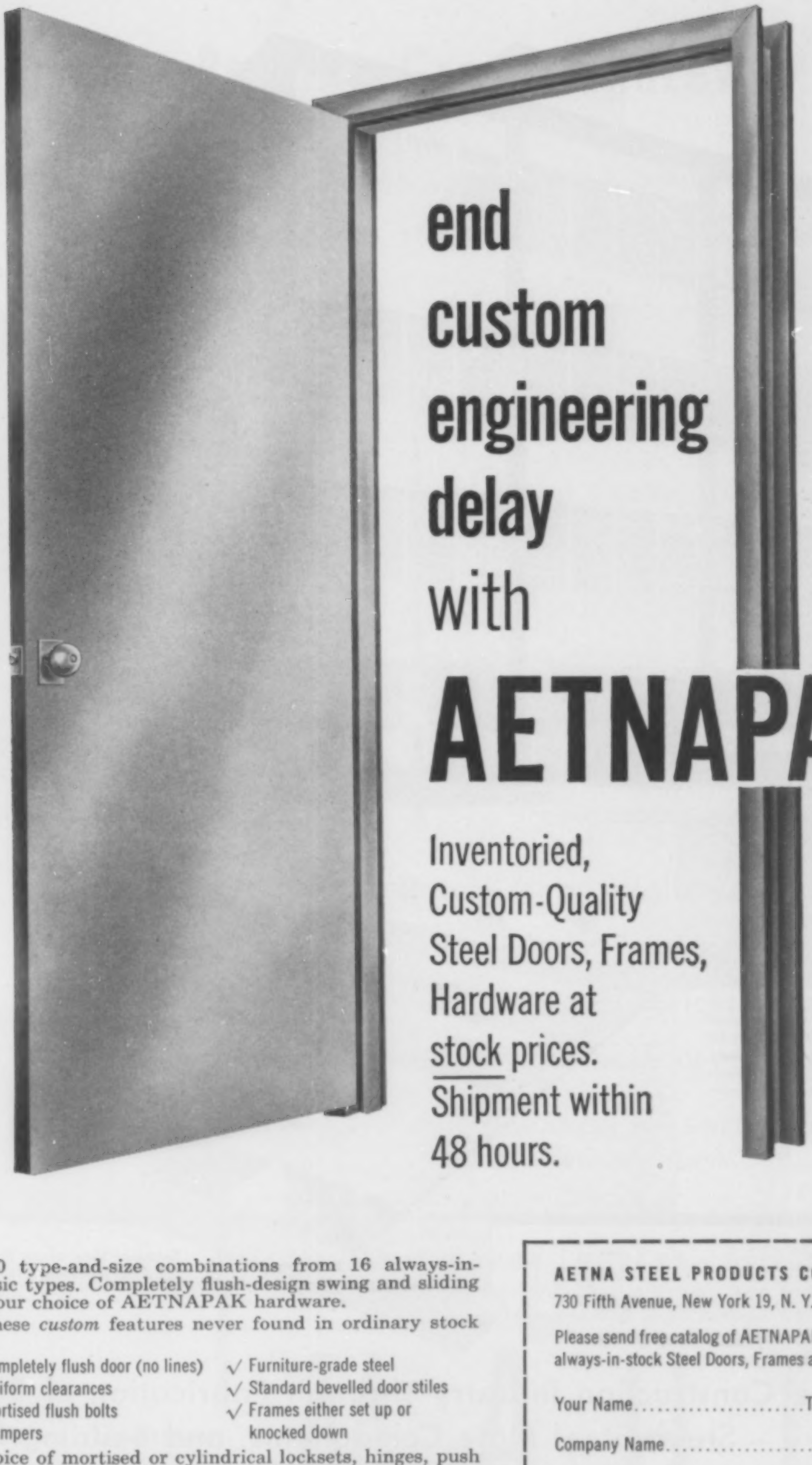

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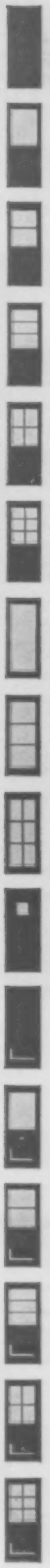

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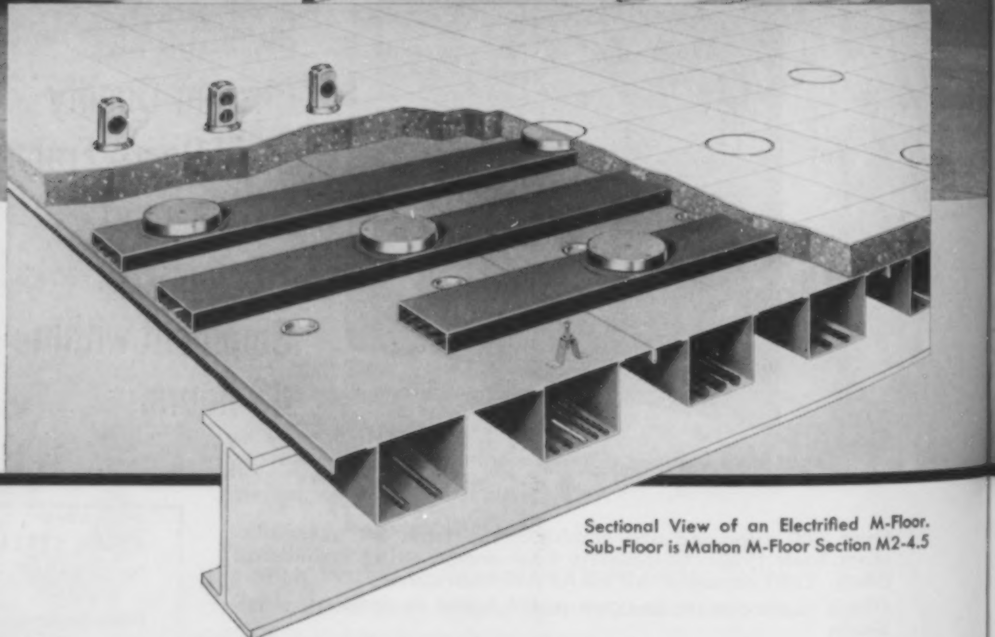

Sectional View of an Electrified M-Floor. Sub-Floor is Mahon M-Floor Section M2-4.5

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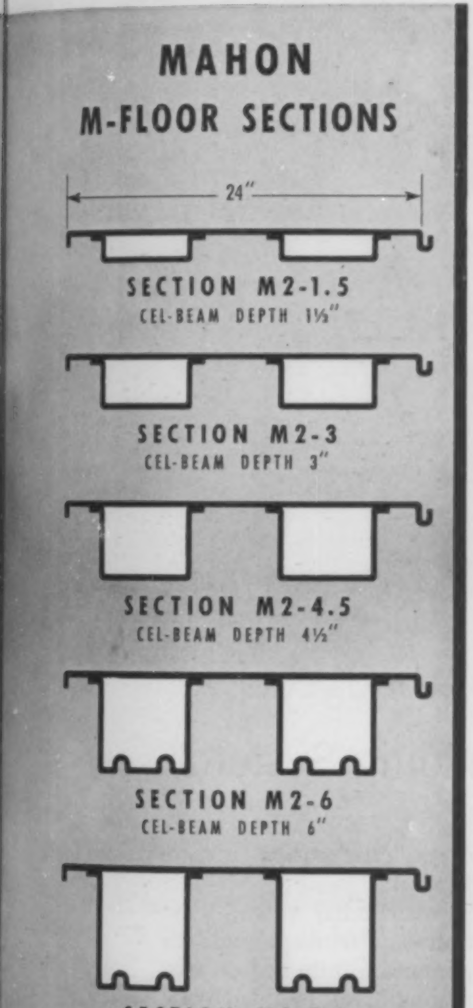
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SECTION M2-1.5
CEL-BEAM DEPTH 1½"
SECTION M2-3
CEL-BEAM DEPTH 3"
SECTION M2-4.5
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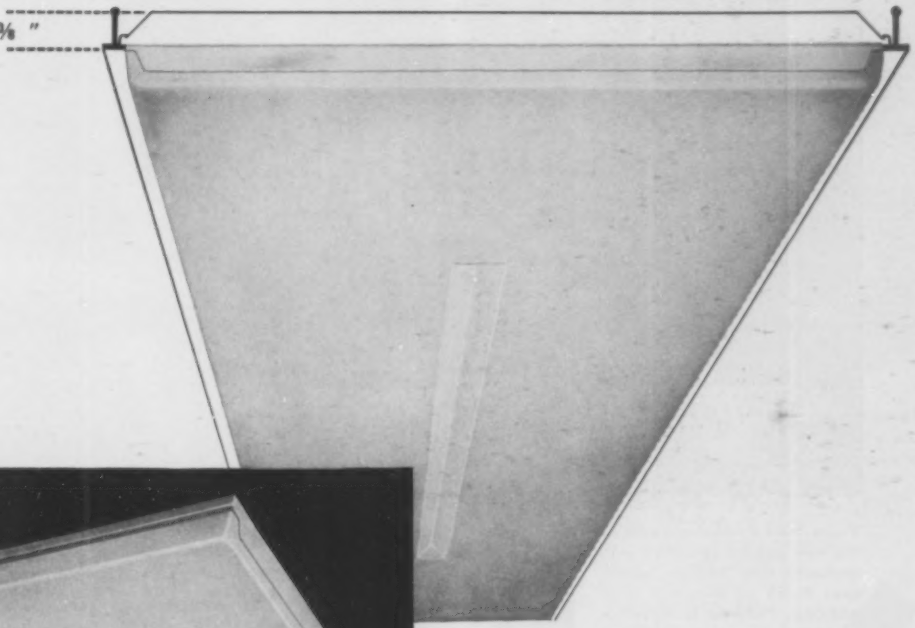

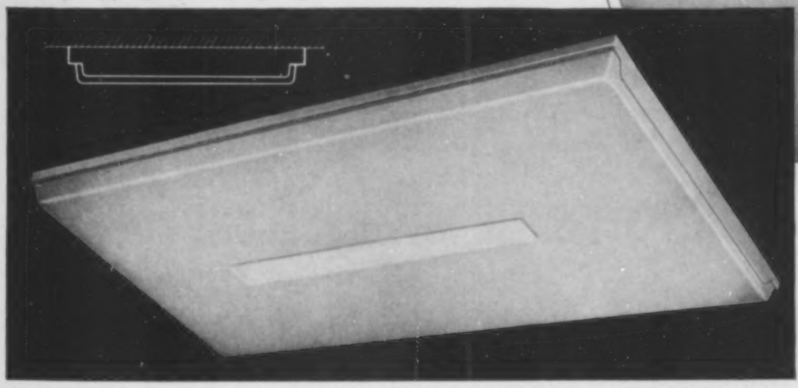

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NEW PRODUCTS
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FROM TRUSCON

Vision-Vent installations such as this now can be specified with exclusive new Truscon Supercoat Finish to eliminate field painting. Pictured is Activities Building, Georgia Training School for Girls, Adamsville, Ga. John J. Harte, architect. Abco Builders, contractor.

# New...Truscon Vision-Vent Window Walls with Sensational Supercoat Finish

*Install without painting!*

*Stave off maintenance painting!*

*7 Colors!*

Now, you can get the solid strength of steel for curtain walls and windows and save field painting costs, too. New Truscon Supercoat Process is factory-applied to eliminate all field painting . . . both at installation and during the years.

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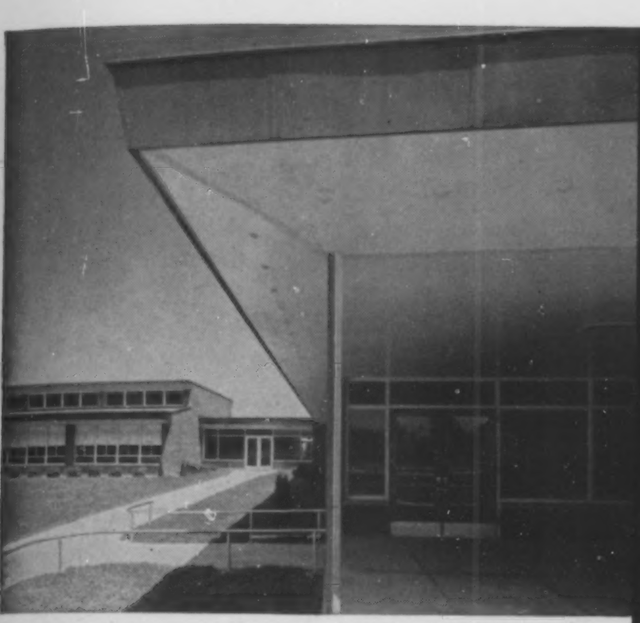
With Truscon Supercoat and Vision-Vent Window Walls, there is no need to sacrifice strength and solidity in walls and windows simply to avoid painting. Supercoat Process can be furnished now on specification for all Vision-Vent types . . . as well as in factory shipment on all Truscon Steel Windows for commercial, institutional, and industrial construction. Choice of seven colors.

See Sweet's (17b/Tr) or send coupon for Supercoat booklet. Supercoat sample on request.



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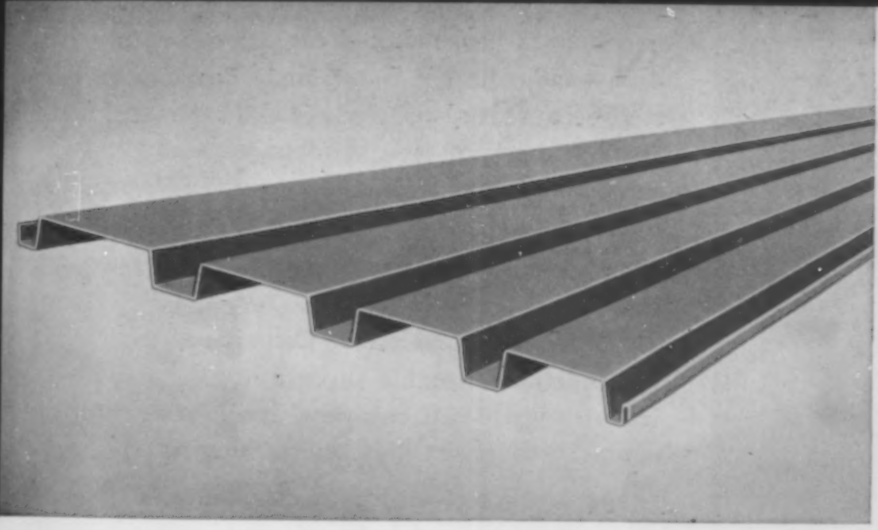

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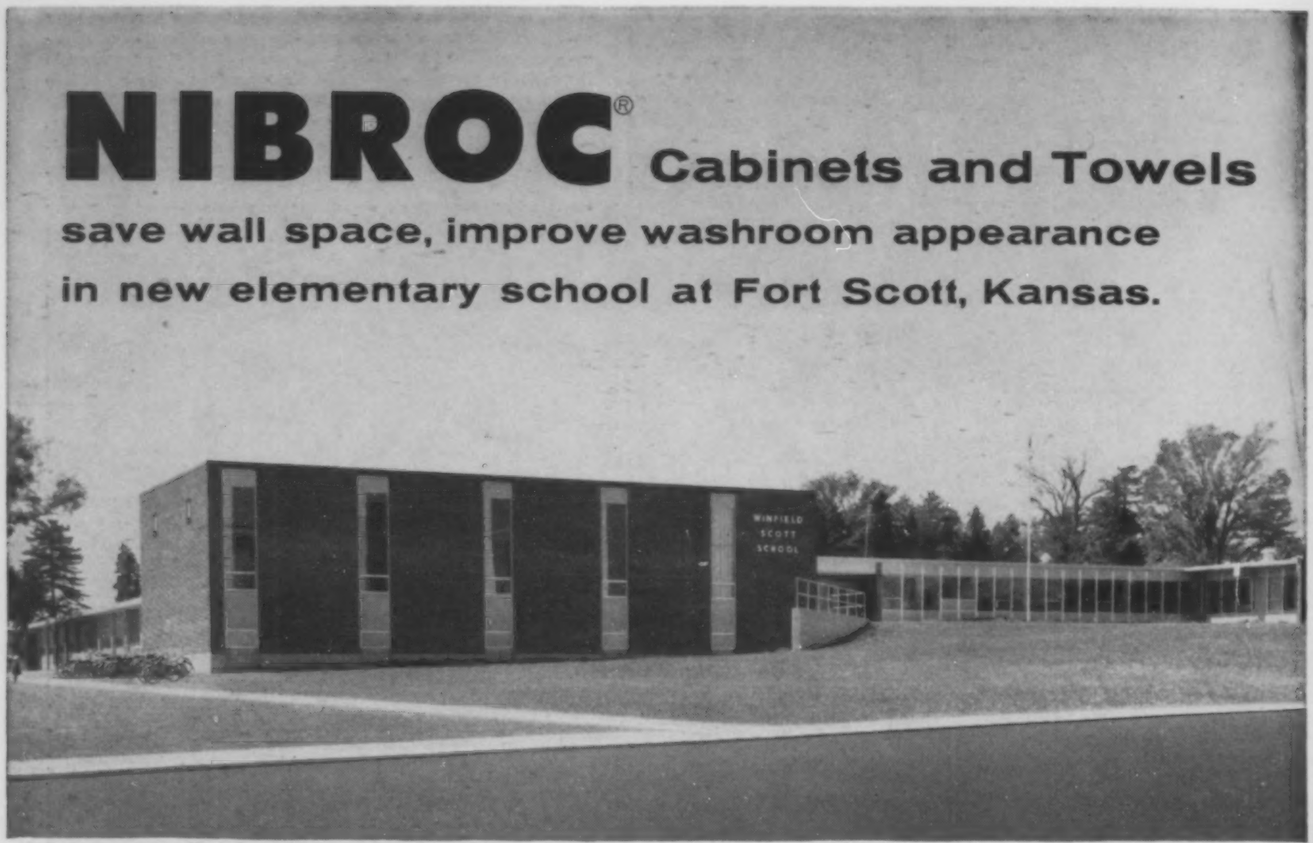

**NIBROC®** Cabinets and Towels
save wall space, improve washroom appearance
in new elementary school at Fort Scott, Kansas.

ARCHITECTS: Williamson-Loebsack & Associates, Topeka, Kansas

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**IT WILL PAY YOU** to specify *Nibroc* Cabinets and *Nibroc* Towels when planning your next building. Look in the Yellow Pages under Paper Towels for nearest distributor. Or write Dept. UN5, Boston.

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**SEE SWEETS CATALOG** for information about Nibroc Cabinets—wall, floor model and recessed.

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BY MOE LIGHT

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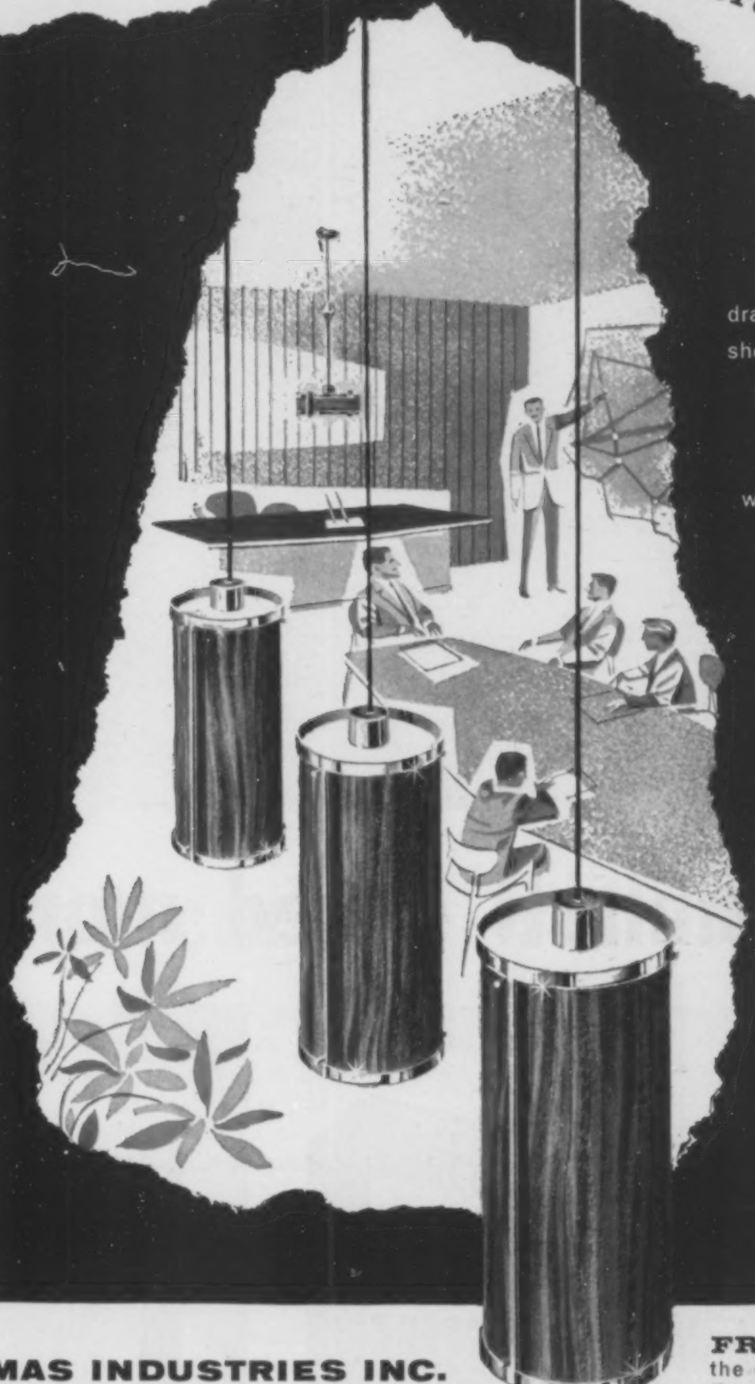

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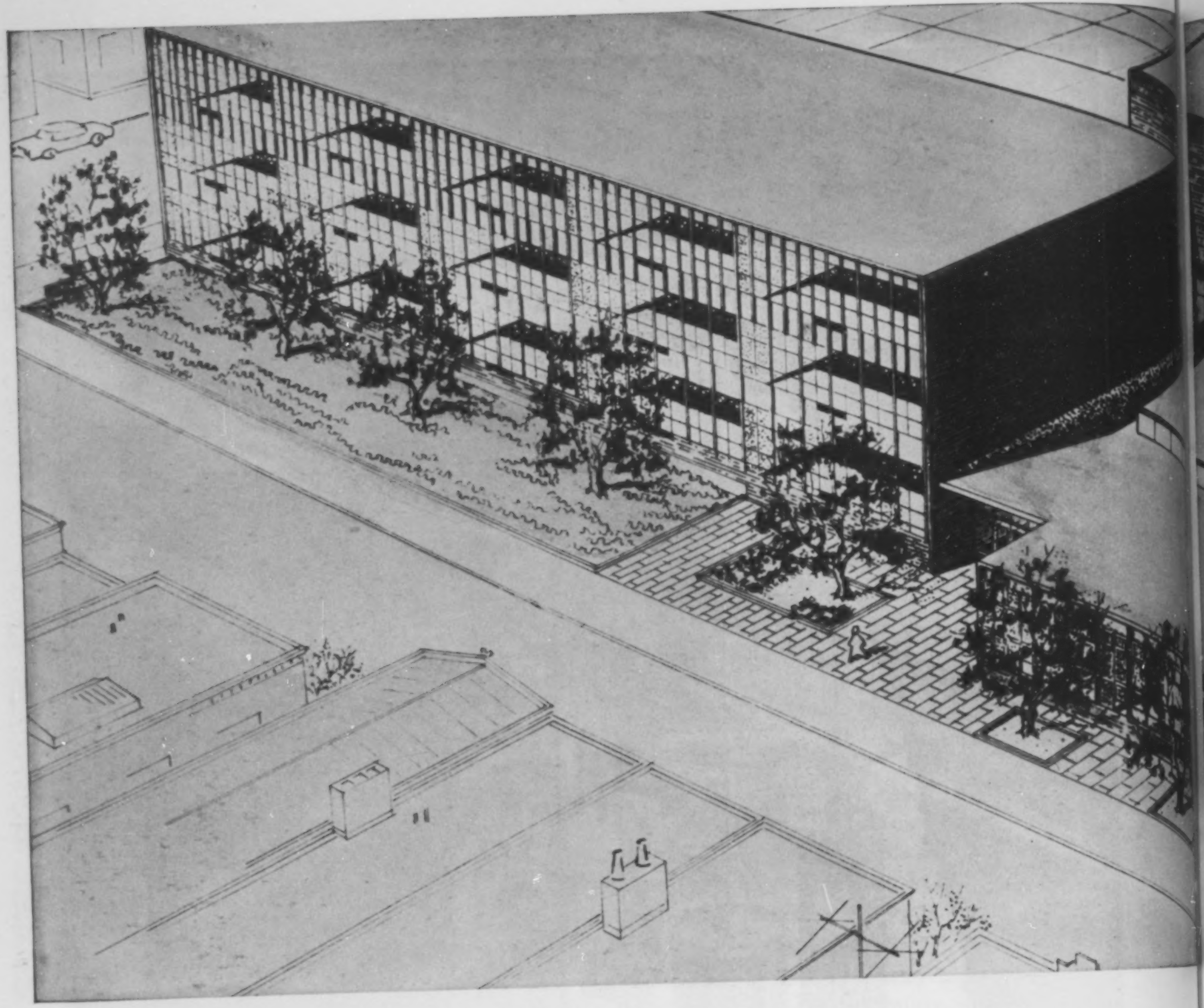
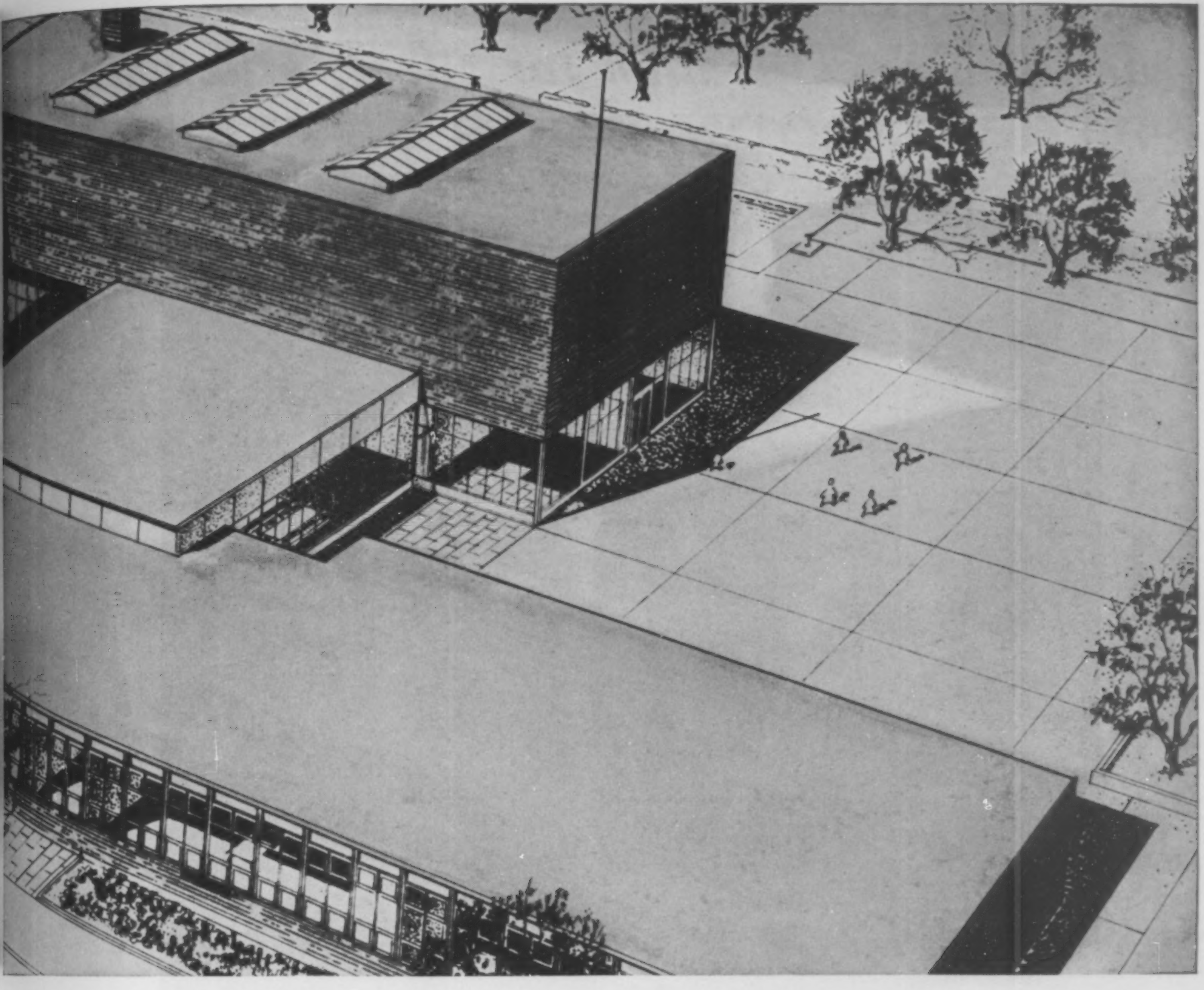


# How Cincinnati saved money on

Washington Park Elementary School, Cincinnati, Ohio. Architect: Charles Burchard, Cincinnati, Ohio. Consulting Engineers: A.M. Kinney, Inc., Cincinnati, Ohio. Approximately 1100 units of Type H Lupton Curtain Wall were used in combination with about 6000 feet of mullions. Window units have fixed glass combined with ventilators.

Windows themselves become walls in this new school. Natural lighting is abundant. Ventilation is draft-free, since two types of "Master" projected windows (in and out opening) were selected.



# its first curtain wall school

Cincinnati's new, 1000 pupil Washington Park Elementary School rises boldly, with pure purpose, from the heart of the city's downtown district. It's a Lupton aluminum *curtain wall* school—one of many in the country, but the first building in Cincinnati to utilize this modern, low-cost construction system.

Savings for Cincinnati's new school started with installation of these Lupton curtain wall units. As on previous projects, panels were delivered direct to the job site, ready for installation even before the building frame was finished. Moreover, they are installed from the *inside*, without heavy hoists or scaffolding. Since lightweight Lupton curtain walls are about one-third as thick as conventional masonry, there's an extra dividend in usable floor space. In fact, overall weight of the building is considerably reduced, which lowers cost of foundation and framework.

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Wouldn't you like to know more about Lupton aluminum curtain wall systems, and how they can save you money? See Sweet's (Sections 3 and 17) for the Michael Flynn Curtain Wall and Metal Window Catalogs, and write to us for further information. For fast action, look up the Lupton representative in your Yellow Pages, under "Windows—Metal."

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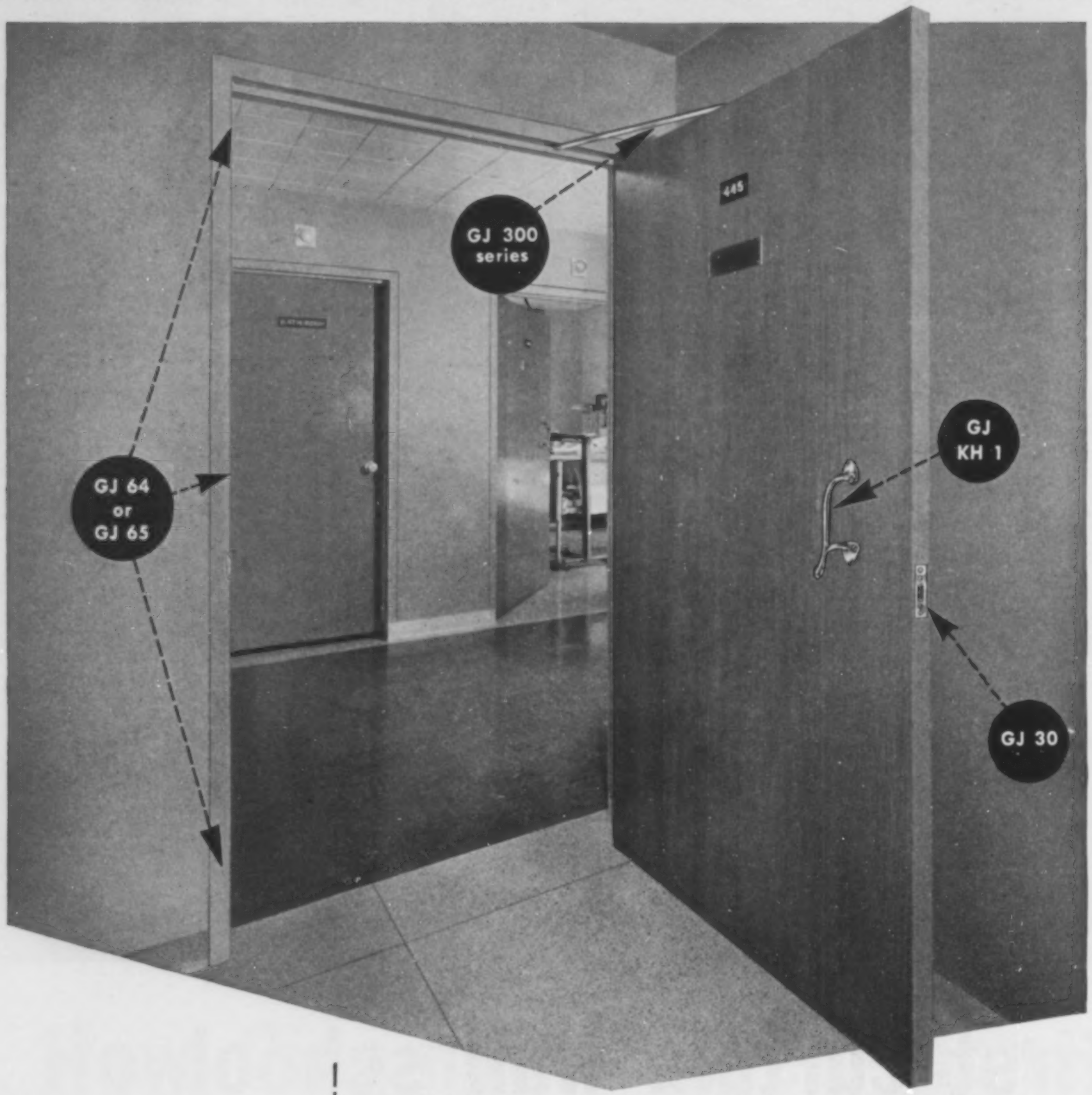
# PATIENT ROOM DOOR CONTROL



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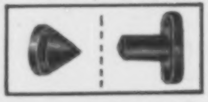

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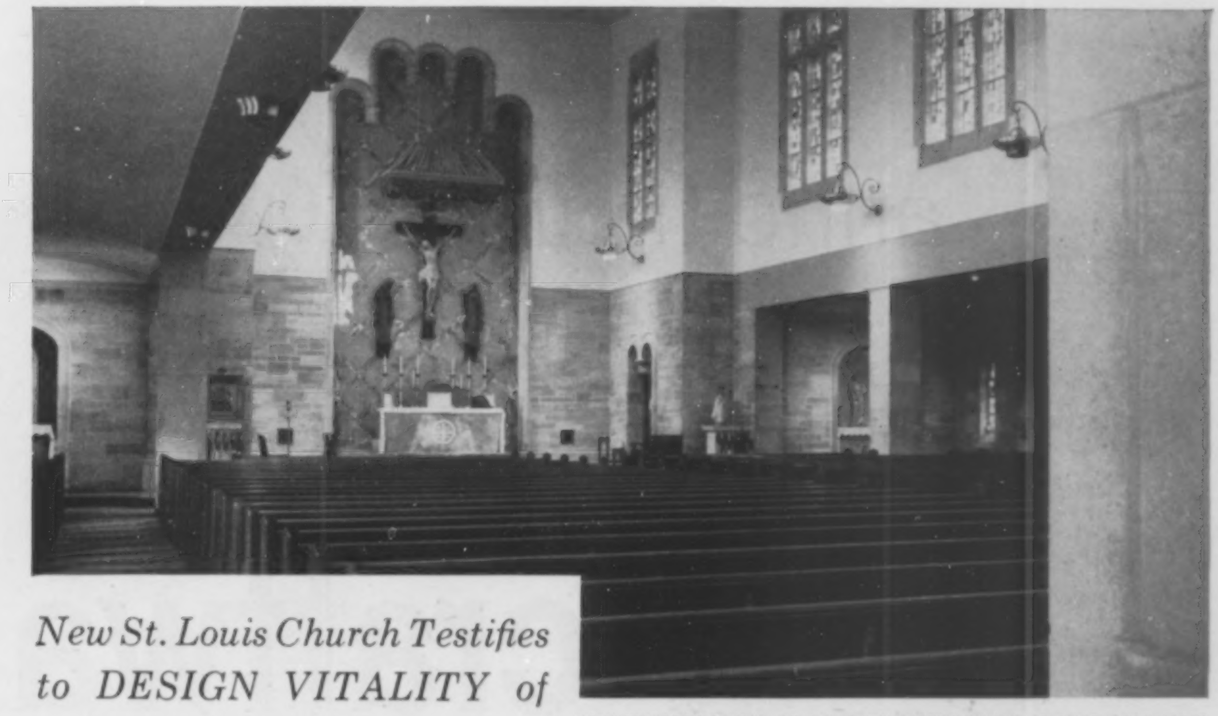
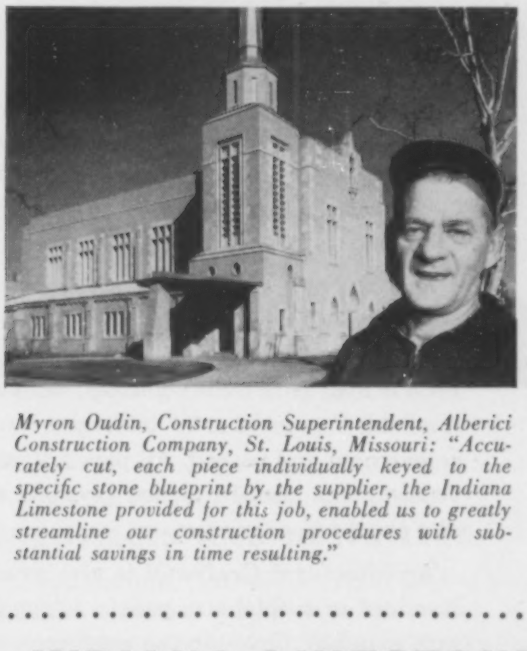


HOLY INNOCENT CHURCH, ST. LOUIS, MO., HARRY IHMSEN HELLMUTH, ARCHITECT

## *New St. Louis Church Testifies to DESIGN VITALITY of*

# INDIANA LIMESTONE

Rabbeted sills, mullions and lintels for art glass windows which require no metal frames, precision-cut moldings and door jambs, and an interior of random Indiana Limestone veneer demonstrate the wide and effective use which architect Harry Ihmsen Hellmuth makes of this time-proven material in designing St. Louis' new Holy Innocent church. "During the 50 years that we have been designing religious structures and other buildings throughout the United States, Indiana Limestone has proven its versatility, its economy and maintenance-free quality to such a degree that we rarely consider other materials for use upon institutional structures."



*Myron Oudin, Construction Superintendent, Alberici Construction Company, St. Louis, Missouri: "Accurately cut, each piece individually keyed to the specific stone blueprint by the supplier, the Indiana Limestone provided for this job, enabled us to greatly streamline our construction procedures with substantial savings in time resulting."*

"We find that the use of Indiana Limestone because of its variety of shades and textures, not only relieves monotony, but at the same time, effects that calm, ordered attitude desired in churches and institutional buildings . . . a unique duality of interest and conservatism."

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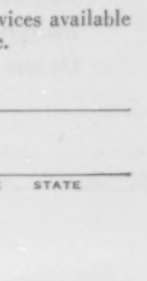

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**Another Roddis "first"! New, veneered paneling of exceptional strength and rigidity . . . with a new "solid feel". Gives many of the advantages of ¾" material yet costs far less!**

Now! Many of the characteristics of the finest ¾" plywood paneling . . . at real cost savings . . . with Roddis' new 7/16" Architectural Craftwall!

Sturdy and solid-feeling, Architectural Craftwall is made from choice, hardwood veneers bonded to a ⅜" center of Timblend, Roddis' amazing man-made board.

*This exclusive Timblend center makes the big difference!* A unique, wood blend shavings board, Timblend gives extra strength and rigidity . . . assures maximum freedom from movement after installation. Architectural Craftwall stays put!

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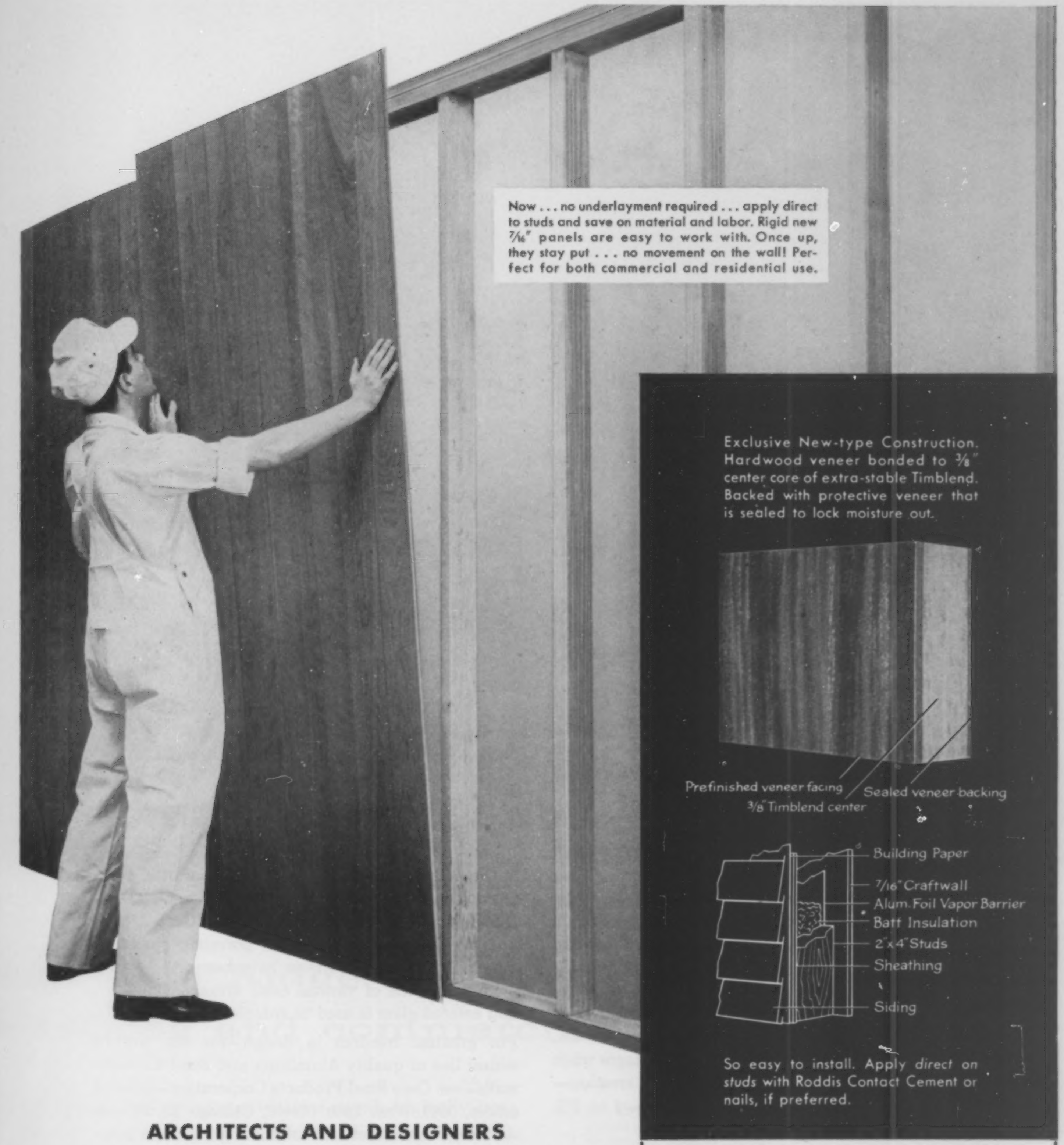

Now . . . no underlayment required . . . apply direct to studs and save on material and labor. Rigid new $\frac{7}{16}$" panels are easy to work with. Once up, they stay put . . . no movement on the wall! Perfect for both commercial and residential use.

Exclusive New-type Construction. Hardwood veneer bonded to $\frac{3}{8}$" center core of extra-stable Timblend. Backed with protective veneer that is sealed to lock moisture out.

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So easy to install. Apply *direct on studs* with Roddis Contact Cement or nails, if preferred.

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## CECO CURTAINWALL & MODULAR DESIGN

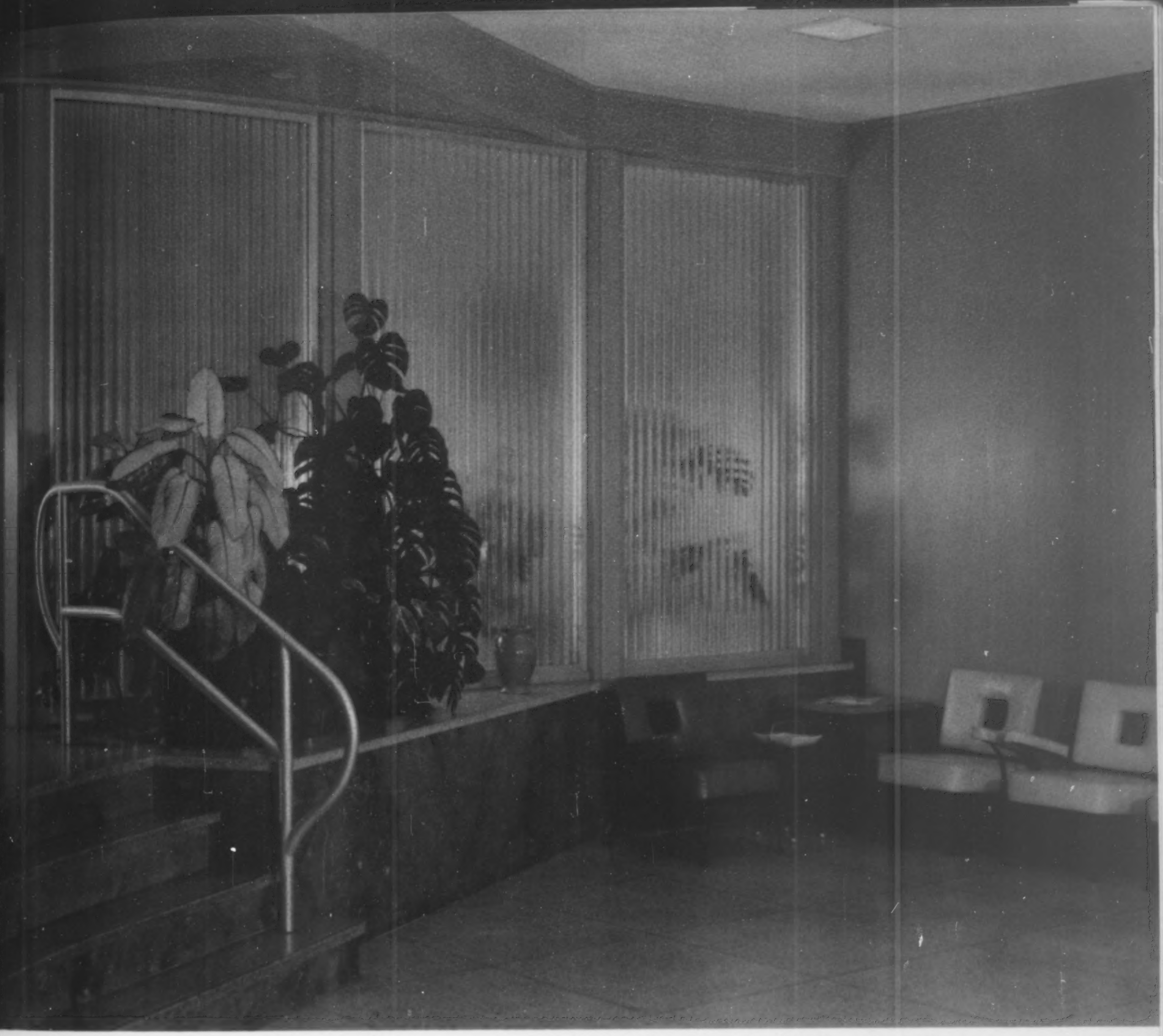
The concept of Modular Planning calls for building components that give the architect even greater freedom, rather than limit him. Such is Ceco Curtainwall, which permits freedom of originality . . . flexibility . . . versatility . . . utility. Ceco provides either aluminum or steel sections that allow a variety of architectural treatments, yet live in a complete harmony with panels of stone, marble, glass or coated metals. Furthermore, you gain these added advantages when you specify Ceco Curtainwall: speedy erection—light construction—economy of materials—4 to 6% more floor space.

Model of Modular Design employing Ceco Products is the Wilson Junior High School, Charlotte, N.C. Occupied within 8 months after bids were taken, this 3-wing structure tastefully blends Ceco Aluminum Projected Windows with porcelain enameled panels. Most unusual effects have been attained by adapting panels of various color arrangements . . . and colored glass is used to complement the panels.

For greatest freedom in design—for the world's widest line of quality Aluminum and Steel Curtainwalls—see Ceco Steel Products Corporation—general offices, 5601 West 26th Street, Chicago 50, Illinois—offices, warehouses and fabricating plants in principal cities.

CECO STEEL IN CONSTRUCTION PRODUCTS CECO ENGINEERING MAKES THE BIG DIFFERENCE

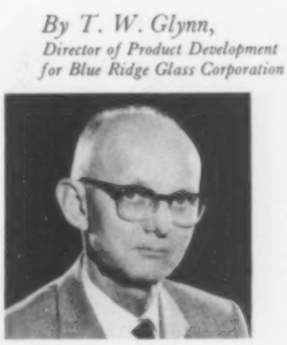
Windows, Screens / Hollow-Metal Doors / Steelforms / Concrete Reinforcing / Steel Joists / Metal Roof Deck / Metal Lath



Corrugated glass in reception lobby screens corridor beyond—shares light, decorates. Electric Controller & Mfg. Div. of Square D Company, Cleveland, Ohio. ARCHITECTS: A. E. Rowe & Associates.

# How Blue Ridge solves special problems in offices and commercial buildings

*By T. W. Glynn,*
*Director of Product Development for Blue Ridge Glass Corporation*



Providing privacy for employes without psychologically boxing them in . . . dividing space without dividing light . . . shutting out an unwanted view without shutting out daylight . . . creating modern décor that is completely functional . . . these are the kinds of problems decorative, translucent patterned glass solves best.

**Functional**—In the reception lobby above, the architects achieved a bright, friendly atmosphere to be enjoyed both day and night. During the day, the corridor shares daylight

## "Blue Ridge Glass is a designer's foil."

with the window-walled lobby. At night, lights from the corridor beyond cast interesting reflections on the translucent glass. The patterned glass used here is Blue Ridge Corrugated Glass.

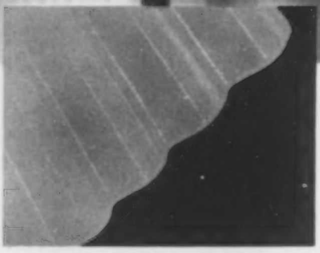
**Light and privacy**—Maximum use of daylight is obtained in hallway and offices (left) with floor-to-ceiling partitions of Huewhite® glass. For design relief, Huewhite Corrugated is used in some partitions. Occupants feel a sense of privacy. Huewhite delivers very wide light distribution that is almost uniform down to incident of 15 degrees. It scatters daylight appreciably even down to an angle of 5 degrees.

### Framing and maintenance

The offices below will not give that "boxed in" feeling because translucent glass partitions make offices seem larger, brighter, more friendly.

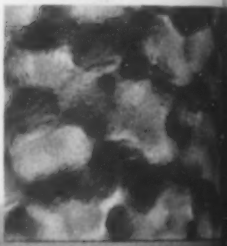
Partitions are economical and fast to

Offices at Blue Ridge Glass Corporation display products company makes: Huewhite, Huewhite Corrugated and a Securit® Interior Glass Door. Designer: Paul McCobb, New York City.



Huewhite Corrugated, ⅛ actual size

Velvex gives excellent light diffus



Patterned glass is interestingly used in the offices of the Federated Department Stores, Inc., Cincinnati, Ohio. Architects: Potter, Tyler, Martin & Roth. Designers: Raymond Loewy Associates.

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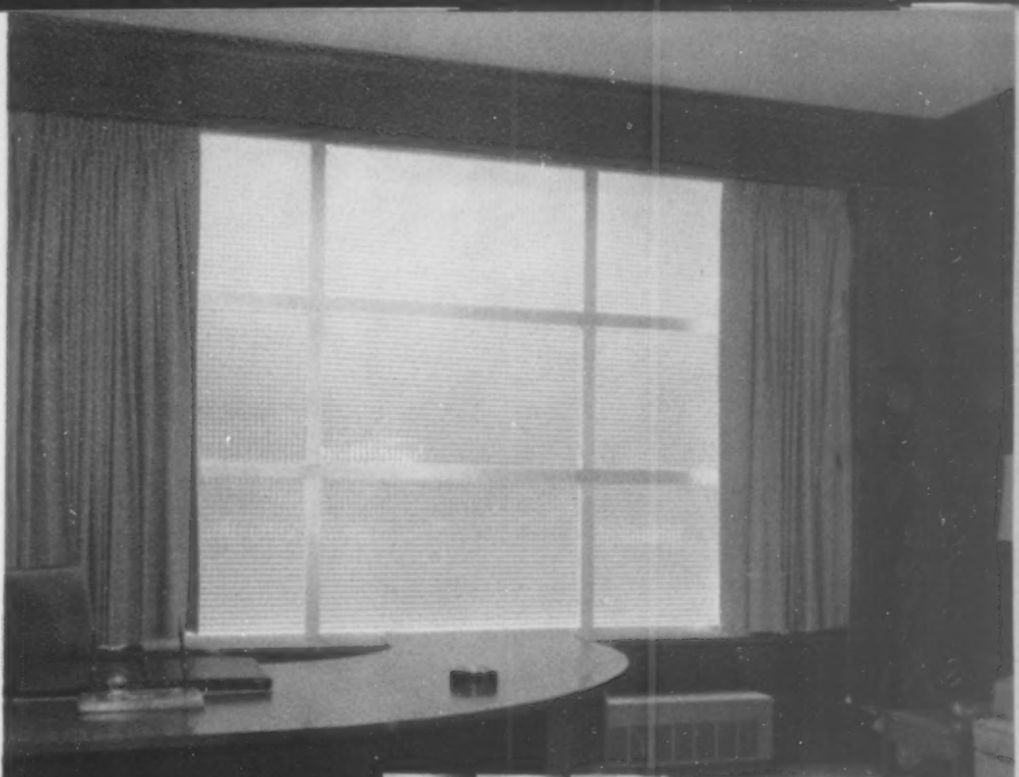
erect. Patterned glass is delivered to the job precut to size. No painting or finishing is required. It can be used with any choice of framing. Blue Ridge Velvex® was used in this modular framing. An occasional washing is the only maintenance required.

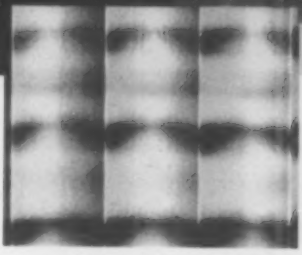
## Screening unwanted views

Imagine this lovely office (right) marred by a view through the window of an alley or parking lot. Blue Ridge Doublex® effectively shuts out the unwanted view, yet admits an abundance of light.

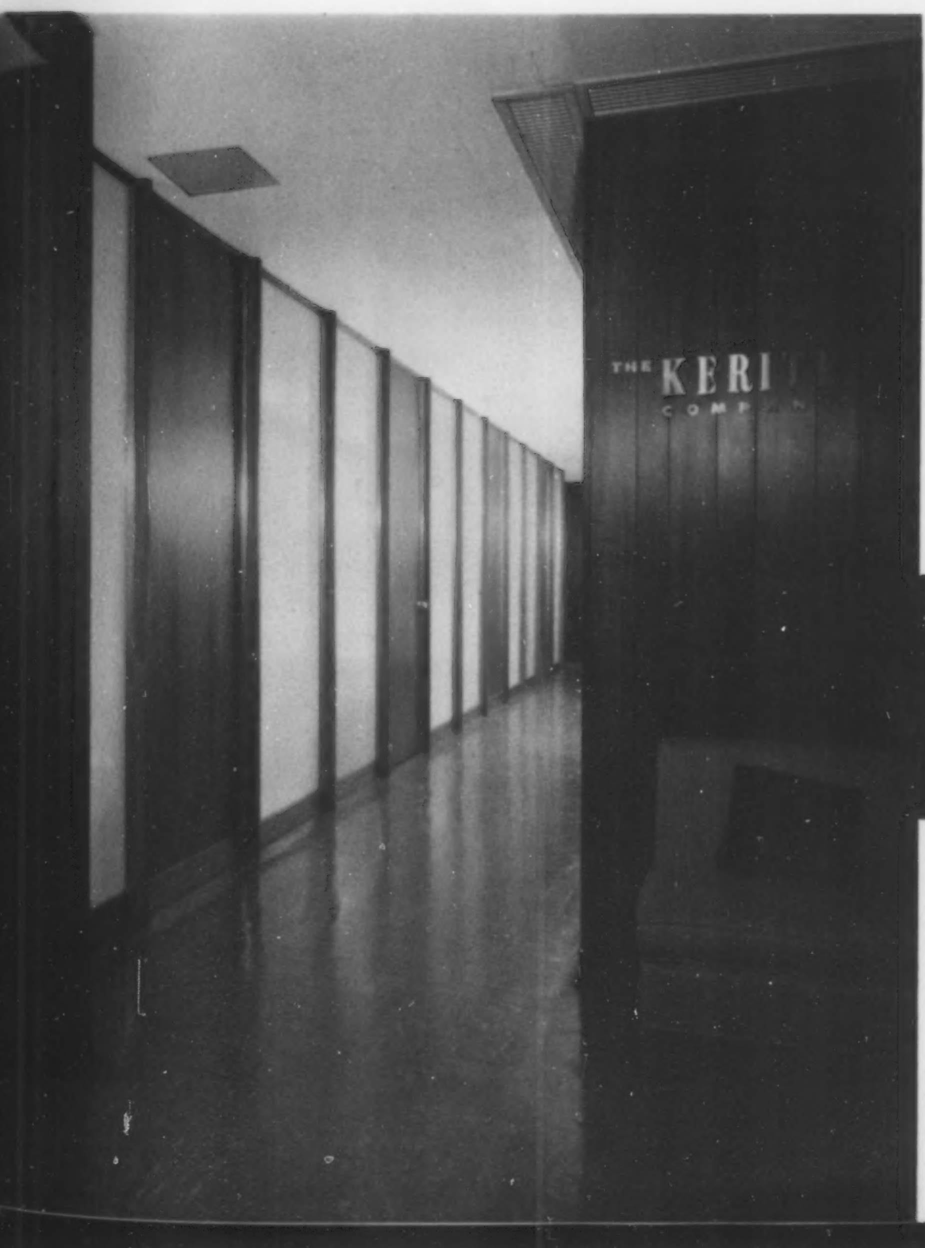
**Design flexibility** — Blue Ridge Glass is a designer's foil. It can be used so many ways to introduce light, to heighten a decorative effect. Huewhite glass was used in the office of the Kerite Company (below). Light passing through the Huewhite enriches the traditionally fine woodwork, relieving an otherwise massive effect.



Doublex glass admits light, screens an unwanted view, decorates this office of Seaman & Eisman, Hicksville, Long Island, N. Y. ARCHITECT: Alfred Shakins.

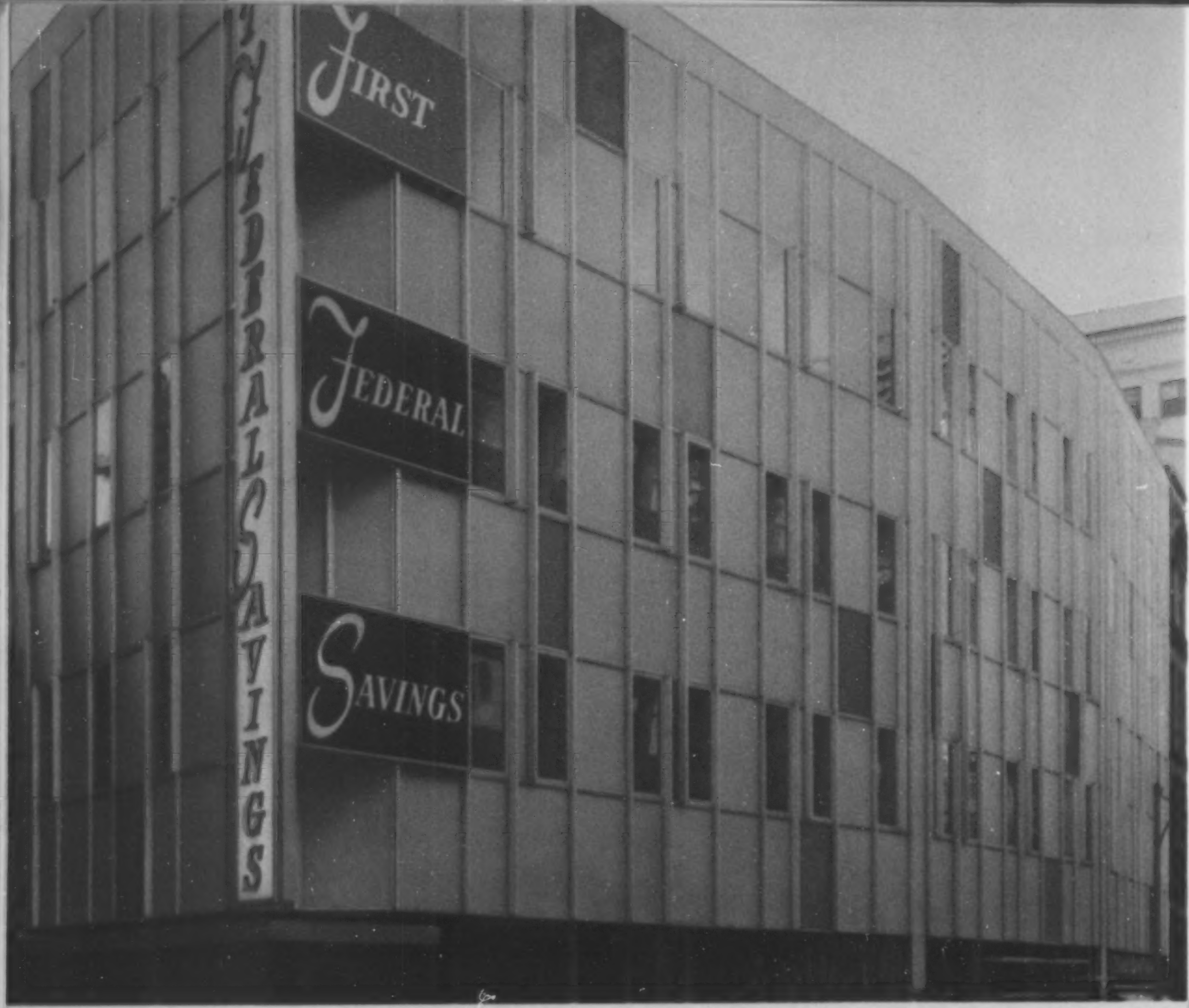


"in DOUBLEX, light dances"



Huewhite combined with rich woodwork enhances the corridors of Kerite Company, New York City. ARCHITECTS: Ebasco Services. INSTALLER: Juno Woodworking.

BLUE RIDGE GLASS CORP.®

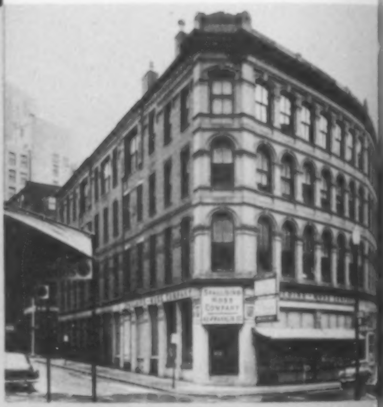


First Federal Savings & Loan Association building, Boston, Mass.
BUILDERS: George B. H. Macomber Company. ARCHITECTS: Bastille Halsey Associates.

**Exterior glass facing**—A new kind of patterned glass called Huetex® is causing excitement in the curtain-wall construction field as a spandrel material. It is 5⁄16″ tempered glass, textured on the weathering side to subdue harsh reflections. Ceramic enamel fused to the back gives it rich, permanent color. The enamel is protected by an atomized aluminum coating that also adds insulating qualities.

Although Huetex is extensively used in smaller structures, like the one shown, it is also used in high-rise buildings. Architects Emery Roth & Sons, New York, recently used Huetex as spandrels for two beautiful office buildings: the 21-story 400 Park Avenue Building and the 30-story Uris Building.

**Modernization project**—The officers of an expanding savings and loan association were faced with the problem of building a new two-story structure or remodeling the four-story building it occupied (right). Cost estimates indicated that remodeling would be less expensive. Huetex glass facing helped give the building a modern appearance (above). On the basis of architectural renderings, the building owners were able to secure lease commitments for the top two floors long before the remodeling was completed.



For additional information on Blue Ridge Glass, look in Sweet's Architectural Files 7a/Li, 3c/BL and 16d/BL.
Also Sweet's Industrial Construction File 3f/Li, Light Construction File 1f/Li and Plant Engineering File 5b/BL.

BLUE RIDGE GLASS CORP.®

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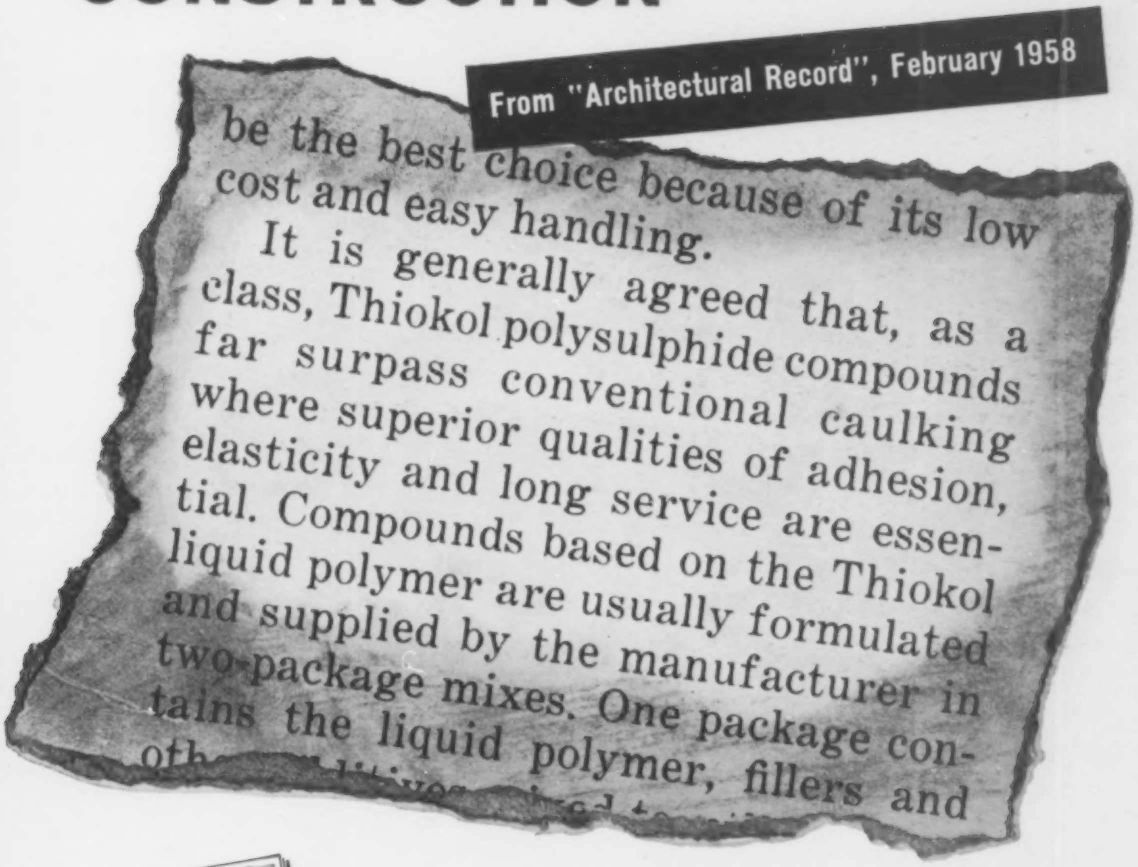
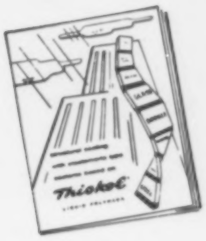
# IMPORTANT TO SPECIFIERS OF CURTAIN WALL CONSTRUCTION



From "Architectural Record", February 1958

be the best choice because of its low cost and easy handling.

It is generally agreed that, as a class, Thiokol polysulphide compounds far surpass conventional caulking where superior qualities of adhesion, elasticity and long service are essential. Compounds based on the Thiokol liquid polymer are usually formulated and supplied by the manufacturer in two-package mixes. One package contains the liquid polymer, fillers and



*The above is reproduced from* "JOINTS FOR CURTAIN WALLS" *which appeared in Architectural Record, February, 1958. If you would like a reprint of the complete article or a copy of a new reference book telling the complete story on Thiokol polysulphide type elastomeric sealants, write Dept. 32, Thiokol Chemical Corporation, Trenton 7, New Jersey.*

The article "Joints For Curtain Walls" is a condensation of "Joints in Metal Curtain Walls," Study No. 2 in a new series of investigations in the Curtain Wall Research Project at the School of Architecture of Princeton University. It was sponsored by the Committee of Stainless Steel Producers of American Iron and Steel Institute.

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# Savings institution practices what it preaches

This sky-blue building is the home of the First Federal Savings & Loan Association of Philadelphia. Over a big clock at one of the entrances, there is a sign that says, "It's Time to Save," and the designers of this building **did** save with porcelain enameled steel curtain wall panels set into a grid of everlasting Stainless Steel.

The prefabricated steel panels were simply bolted into place, so the framing was quickly finished, and the building was occupied without delay.

Money will be saved on maintenance for years to come, because the porcelain enameled panels and Stainless Steel require nothing more than

FIRST FEDERAL SAVINGS

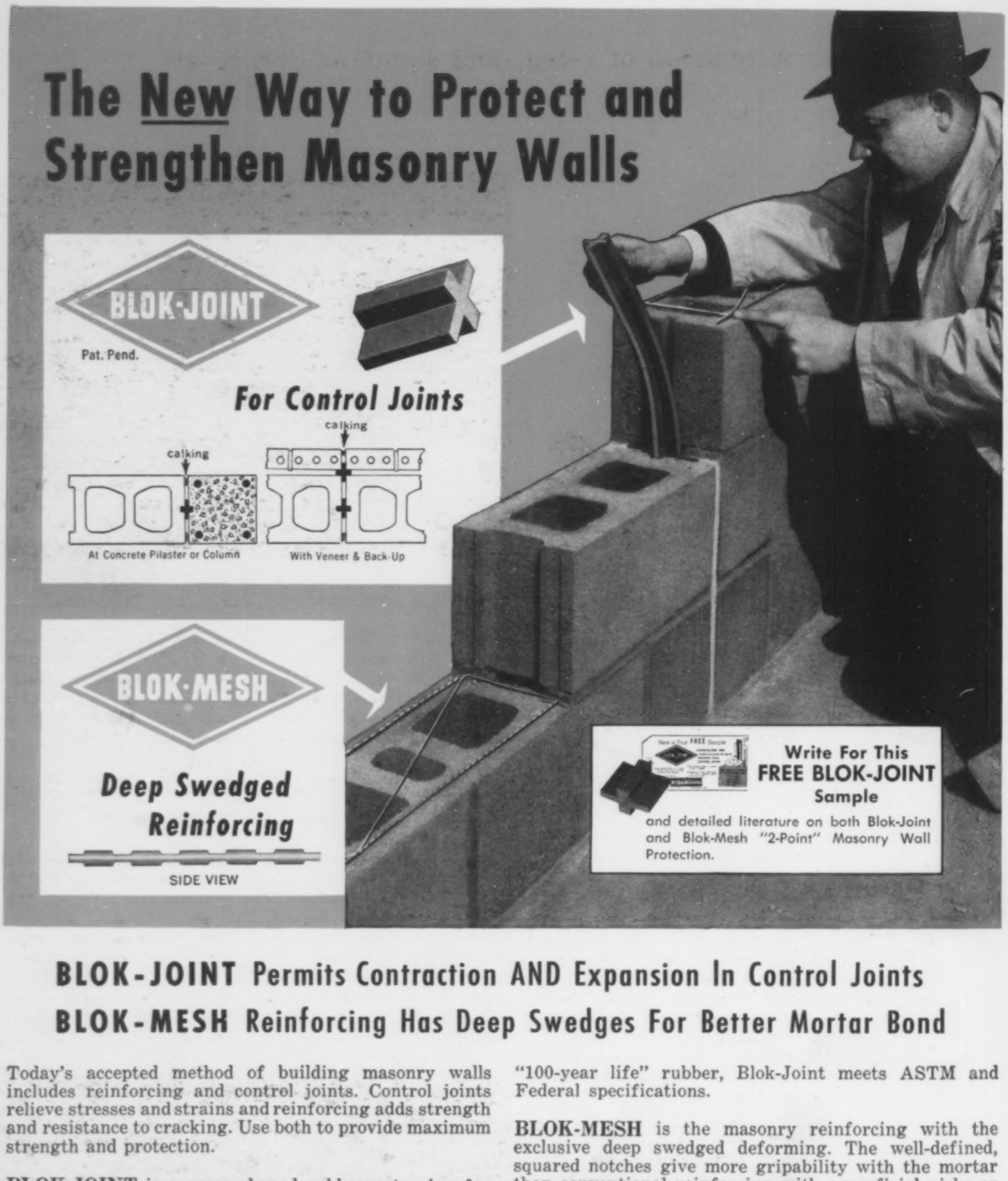
an occasional washing—and ordinary rainfall will usually do the job.

Naturally, these cost-saving measures were extremely important to the money-conscious men at First Federal. But never forget that any financial institution must attract people and their business, and this magnificent building does the job exceedingly well. Look at the picture again. Don't you agree? United States Steel Corporation, 525 Wm. Penn Place, Pittsburgh 30, Pa.

**Credits:** Architects: Thalheimer & Weitz, Philadelphia; General Contractor: Golder Construction Company, Inc., Philadelphia; Curtain Wall Fabricator: John G. Leise Metal Works, Inc., Philadelphia; Panel Fabricator: Caloric Architectural Division of Caloric Appliance Corp., Topton, Pa.

USS is a registered trademark

USS **United States Steel**



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## BLOK-JOINT Permits Contraction AND Expansion In Control Joints

## BLOK-MESH Reinforcing Has Deep Swedges For Better Mortar Bond

Today's accepted method of building masonry walls includes reinforcing and control joints. Control joints relieve stresses and strains and reinforcing adds strength and resistance to cracking. Use both to provide maximum strength and protection.

**BLOK-JOINT** is a cross shaped rubber extrusion for making fast, effective control joints in masonry walls. It is used with ordinary metal sash blocks. No special blocks or building paper and mortar fill is needed. Blok-Joint forms a secure interlock for lateral stability —allows *both* contraction and expansion. It can be used in single walls, block walls faced with other masonry, cavity walls and at pilasters or columns. Molded of "100-year life" rubber, Blok-Joint meets ASTM and Federal specifications.

**BLOK-MESH** is the masonry reinforcing with the exclusive deep swedged deforming. The well-defined, squared notches give more gripability with the mortar than conventional reinforcing with superficial nicks or burrs. Blok-Mesh provides effective dovetailing—yet requires no more area in the joint than other types.

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4h/Car Architectural File

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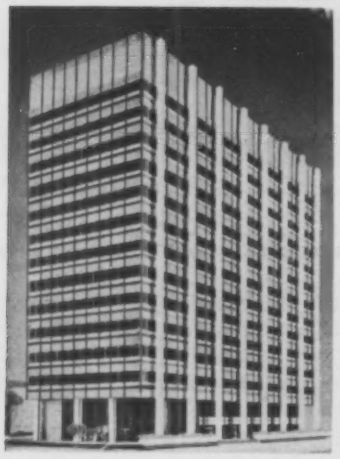
# Projects

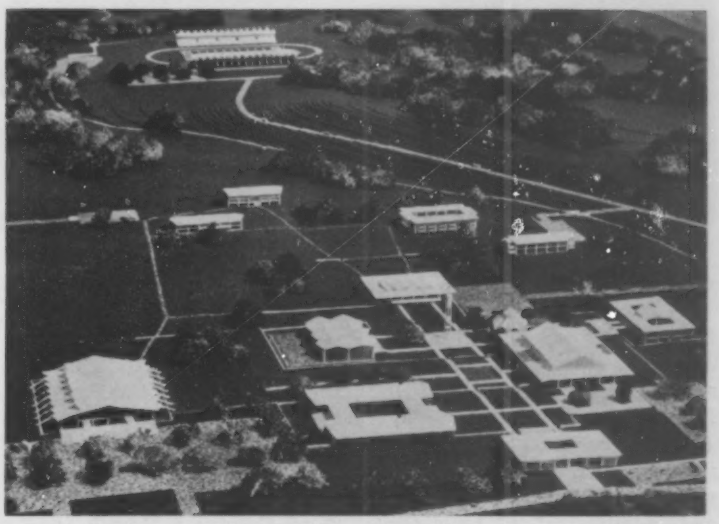
## A roundup of recent and significant proposals

A. GERALD RATTO



### BETHLEHEM TOWER

Not surprisingly, steel will be one of the major materials in the 15-story headquarters (above) of the Bethlehem Pacific Coast Steel Corp. in San Francisco. The entire building will be suspended from free-standing exterior steel columns (as in Inland Steel's new headquarters in Chicago—FORUM, April 1958), and the cooling tower and elevator machinery will be hidden by stainless steel louvers at the top. Other materials will be used, too: Welton Becket & Associates plan to sheathe the exterior columns with white and gray marble tile, and spandrels will be faced with marble tile in two shades of gray. The new building will be on the edge of San Francisco's Redevelopment Area E, an area of old waterfront and produce market buildings which the city plans to redevelop.



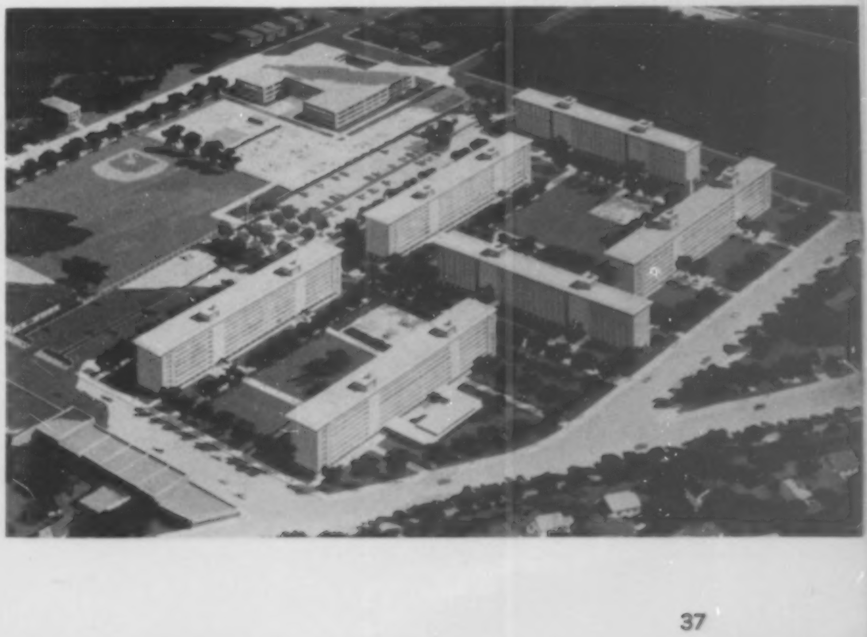
JEROME DROWN

### FOLDED CONCRETE COLLEGE FOR METHODISTS

The Methodist Church plans to build a new college (above) near Fayetteville, North Carolina, and will start with the classroom building (center foreground). Architects Stevens & Wilkinson of Atlanta designed the $4 million project, to be completed in 1963. All buildings will be reinforced concrete, folded slab construction.

### NEW YORK CITY PUBLIC HOUSING, WITH BALCONIES

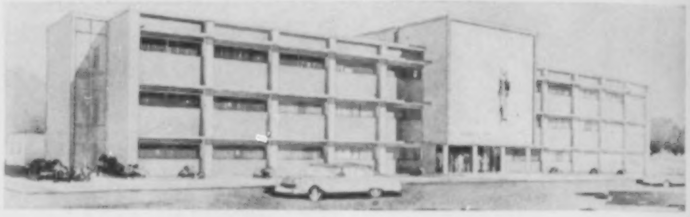
On one of the most attractive sites ever used for public housing in New York City (below), Architects Ballard, Todd & Snibbe have designed a group of balcony-access buildings — the first of this kind approved by the local housing authority. The six eight-story Stapleton Houses on Staten Island will form courtyard patterns enclosing children's playgrounds, shaded sitting areas, and open space. Elevators screened by concrete grilles will stop at each balcony; tenants will enter their apartments directly from the outside "corridor." Cost: $9 million; rent per room: $12.



FAHRENKRUG STUDIO

### TWO-PART RESEARCH AND INDUSTRIAL PARK

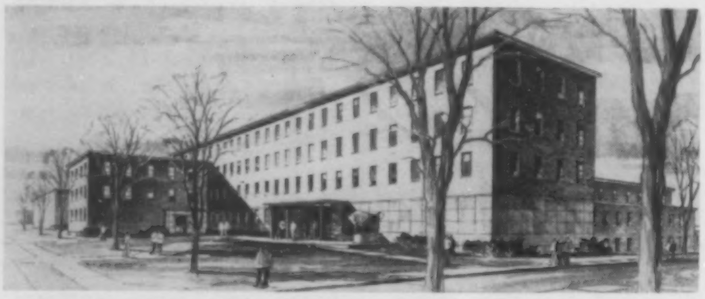
Indiana highway 62 will bisect the multimillion-dollar research and industrial park planned by Mead Johnson & Company (pharmaceuticals) near Evansville, Indiana. First to be built will be eight major research and administration buildings south of the highway: research laboratories (left in photo), the seven-story headquarters, employee development and training center (to right of pool), and cafeteria-reception center, all designed by Skidmore, Owings & Merrill.



### HOSPITAL CLINIC ADDITION IN ILLINOIS

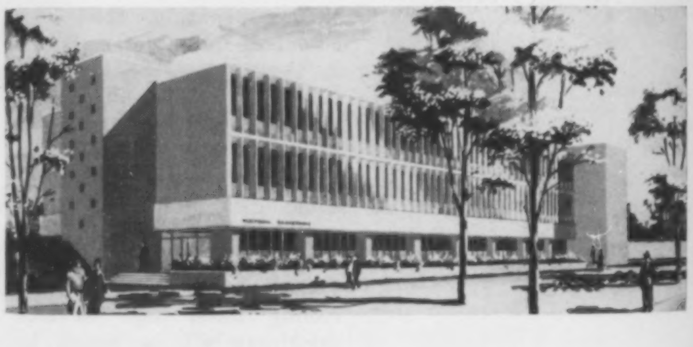
The diagnostic and therapy departments of Carle Hospital Clinic in Urbana, Illinois, will soon move to a separate three-and-one-half story addition (above) now under construction. The $1.1 million addition will be faced with brick between the exposed concrete columns; penthouse is for record storage. Architects: Ellerbe & Co., of St. Paul.

ADOLPH STUDLY



### ANIMAL HUSBANDRY BUILDING AT CORNELL

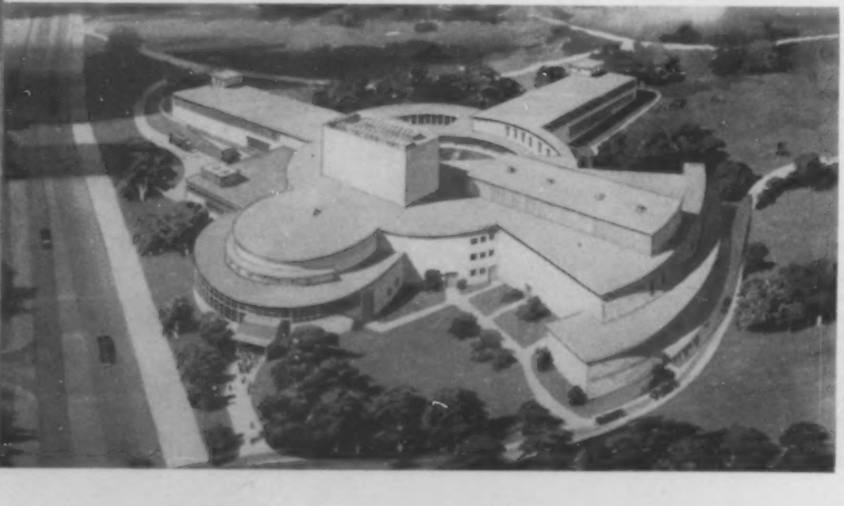
Providing special-purpose space is run of the mill to an architect, but providing space for a hog immobilizer is less commonplace. This was only one of the special requirements confronting James Cameron Mackenzie, architect of the Department of Animal Husbandry building. As part of the New York State College of Agriculture, its design was supervised by the state university architect, Otto J. Teegen.



### MISSOURI SCHOOL OF MINES LABORATORY

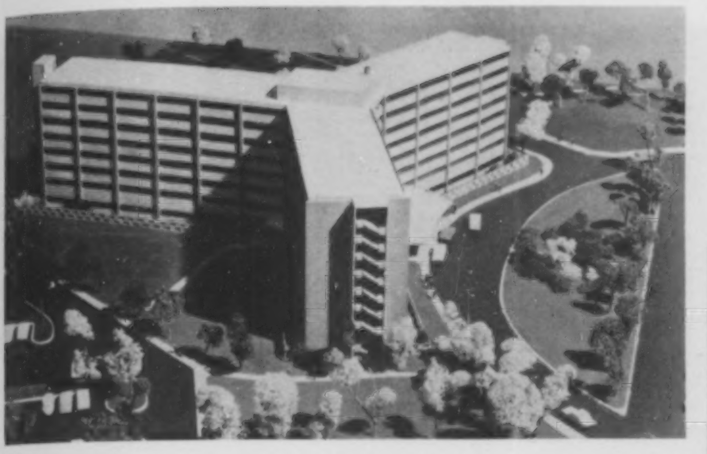
Adapting their design of a new electrical engineering laboratory (above) to the sloping site of the Missouri School of Mines campus at Rolla, Architect P. John Hoener & Associates provided grade entrances at two levels. The building is planned for use in the fall semester of 1959. Exterior elevations on two sides will be panel walls with aluminum and limestone trim; brick end walls will contain stairways.

ADOLPH STUDLY



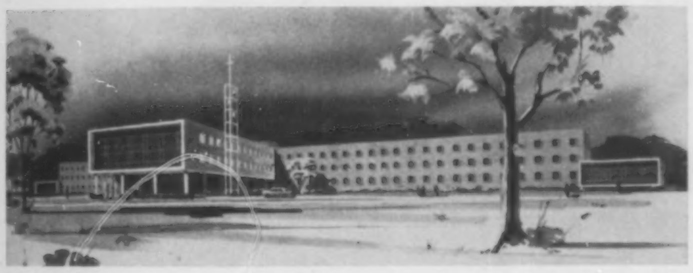
### QUEENS COLLEGE MUSIC AND ARTS CENTER

New York City Architects Fellheimer & Wagner designed this odd-shaped $5.2 million music and arts building (left) for Queens College, Flushing, New York. Combining theater and classroom facilities of various sizes, the chief elements are a round experimental theater at the center, an auditorium seating 2,200 (right), speech and music wings (left).



### SMALL SKYSCRAPERS FOR THE AIR FORCE

Prohibitive land and site development costs made the Air Force revise plans for two-story officers' quarters at Mather Air Force Base, Sacramento, and build up, instead. Daniel, Mann, Johnson & Mendenhall planned the eight-story quarters as a prototype for possible future construction at other bases. The expected cost is $3 million for housing 408 men, just within the Congressional cost limitation of $7,500 per man. Exterior will be exposed concrete.



### CRUCIFORM NOVITIATE IN MINNESOTA

A $3 million seminary for training Jesuit novices will be built in St. Bonifacius, Minnesota. Architects Grellinger & Rose have designed the building (above) in the form of a giant cross, with common facilities such as dining rooms in the foot of the cross, and dormitories in the arms and head. Exterior of the building will be stone, with opaque glass curtain walls and aluminum mullions at the four ends of the cross. The building is scheduled to be finished by 1960.

WALSH PHOTO

### WEST COAST HOTEL-OFFICE BUILDING

A new 405-room hotel will be coupled with an office building (above) in San Francisco. Called the Jack Tar West, the seven-story hotel and nine-story office building will be built by Dallas Builder Charles A. Sammons, at an estimated cost of $10 million. Designed by Thomas M. Price and Hertzka & Knowles, it is to be completed by October 1959.

MOULIN STUDIOS

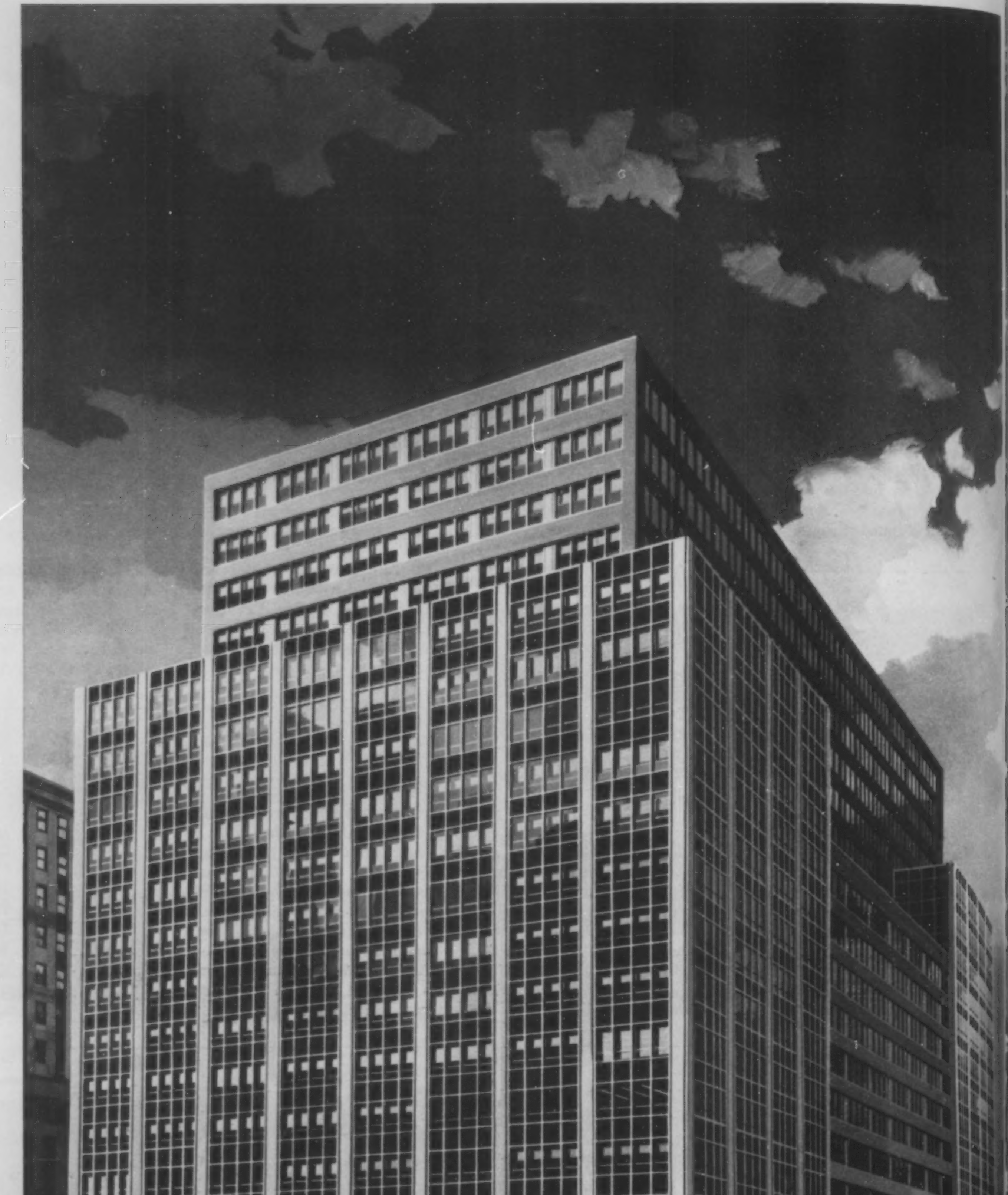
### CALIFORNIA BANK

The Bank of America is planning a new San Francisco building (right) that will be the closest thing to a headquarters for the far-flung banking empire. The $13 million, eight-story building will be the second largest—in terms of area—in the city. Wurster, Bernardi & Emmons designed a heliport to cap the precast concrete building.

### COLORFUL DORMITORY

Part of a scheme for housing 6,500 students at UCLA is this ten-story men's dormitory (right) designed by Welton Becket & Associates. Dykstra Hall, first of eight new dormitories, will provide living quarters for 800 men, two to each 11-by-16-foot room. The one-story recreation, dining, and lounge wing jutting out from the dormitory tower will provide a dining hall seating 550 and an outdoor dining terrace. Color scheme: buff-tan brick with white accents.

HERBERT BRUCE CROSS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# Meet New York's next big office building

Cost: $28 million

Floor Area: one million sq. ft.

Concrete Reinforcement: USS American Welded Wire Fabric

**100 Church Street** is a brand-new twenty-story building now going up in Manhattan. It's an example of modern architecture—simple beauty, efficient design, and permanent construction. Progressive building ideas went into this job, too: a fireproof structural steel frame, short-span floors and USS American Welded Wire Fabric Reinforcement.

**Short-Span Floors**—At 100 Church Street, closely spaced beams support concrete floor slabs of minimum thickness. That's short-span construction-strong, lightweight, economical. Short-span floors save money because less concrete, less time, and less labor are needed for installation. But you couldn't have these advantages without wire fabric.

**USS American Welded Wire Fabric** makes short-span floors possible because it can be drooped continuously over supporting beams. (ACI Code: Sec 505G) It has an allowable working stress of 28,000 lbs. per sq. inch. The New York skyline reveals many short-span-floor skyscrapers such as the Empire State Building, the RCA Building, and the new Socony-Mobil Building. And they're all reinforced with USS American Welded Wire Fabric.

**Specify USS American Welded Wire Fabric.** It's available in a wide variety of styles, sizes, lengths, widths, and finishes . . . in wire gauges from #7/0 to 16 and in longitudinal or transverse wire intervals of 2" to 16". To get complete technical data on USS American Welded Wire Fabric, send for our free catalog. Write today: American Steel & Wire, Rockefeller Building, Cleveland 13, O.

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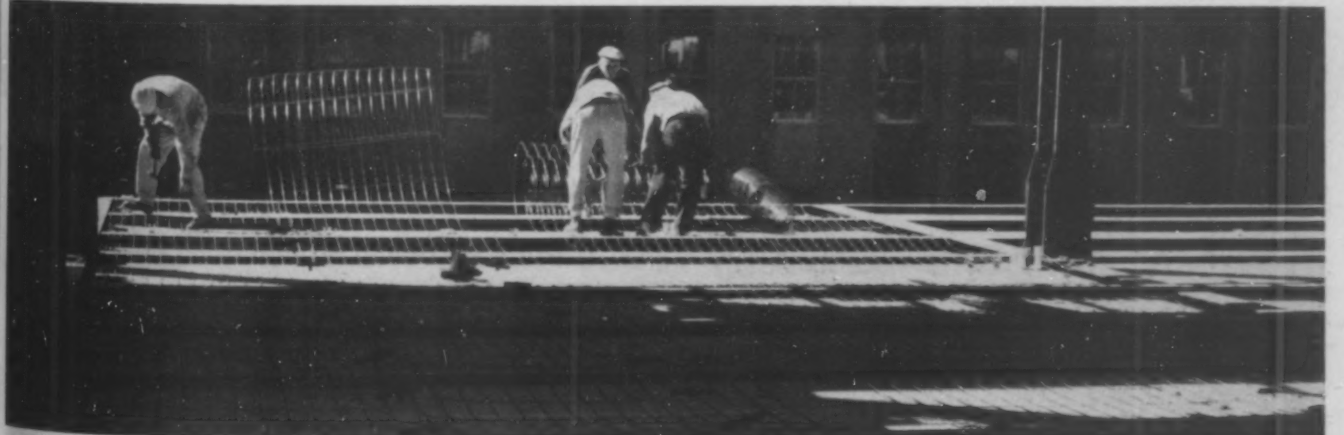

**Short-Span Floors,** reinforced with USS American Welded Wire Fabric, are a key feature of 100 Church Street. USS American Welded Wire Fabric is prefabricated for quick, easy, economical installation in any permanent concrete work.

◀ **An Architect's Conception** of 100 Church Street. These people are building it:
**Architect:** Emery Roth & Son, New York
**Structural Engineer:** James Ruderman, New York
**General Contractor:** Diesel Construction Co., Inc., New York
**Subcontractor on Concrete:** Rizzi Construction Co., Inc., New York
**Welded Wire Fabric Distributor:** Fireproof Products Co., Inc., New York

Remember, buyers will ask, "is it Reinforced"

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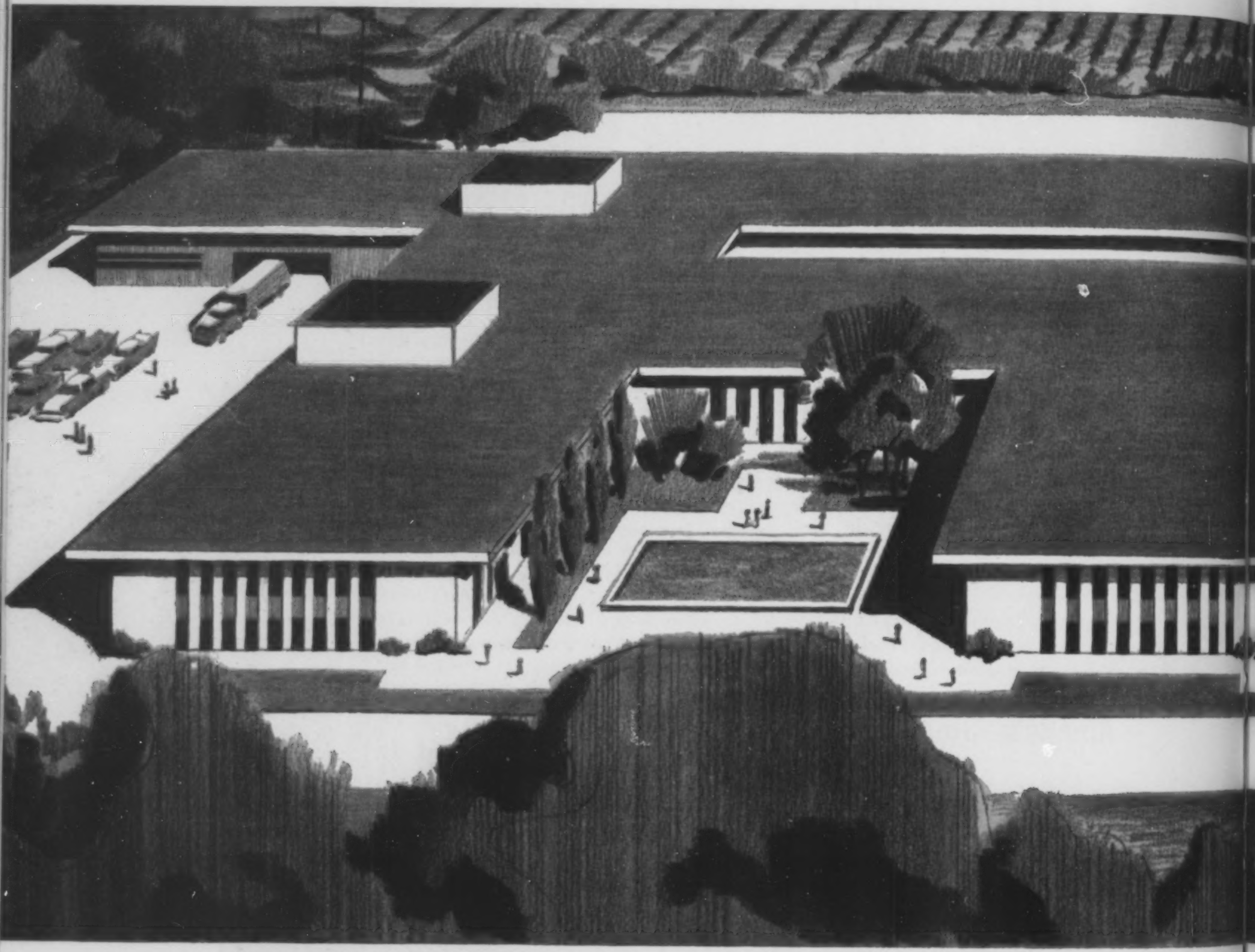

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The 25-Ton Arkla-Servel Cooler

. . . A compact unit, easy to install and light enough for rooftop installation.

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. . . Can be installed singly or in banks to fit any size installation.

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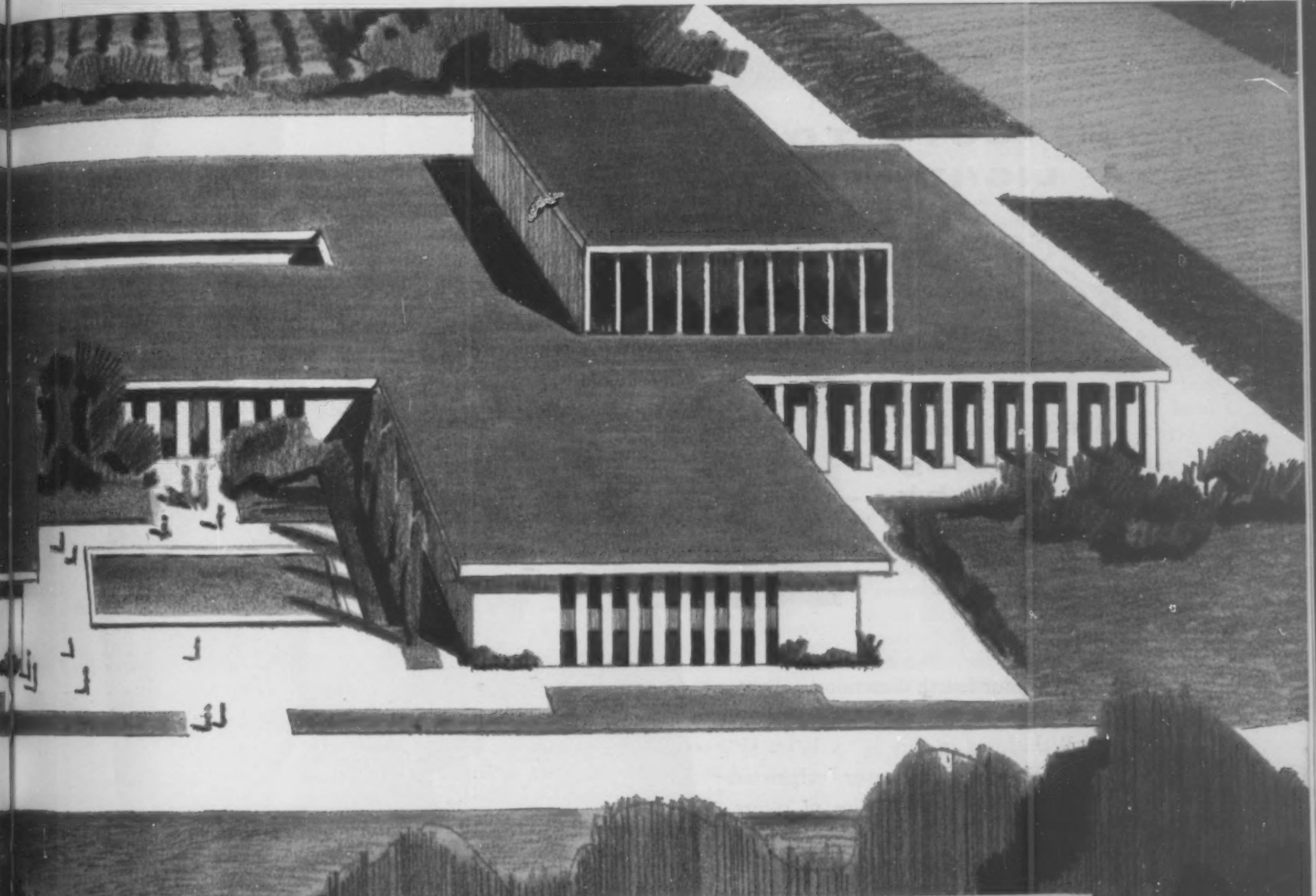

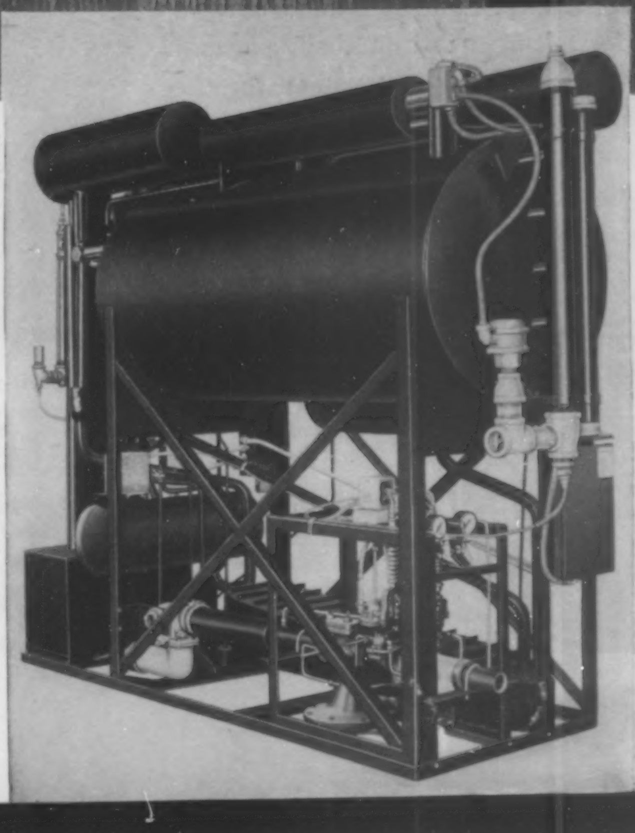

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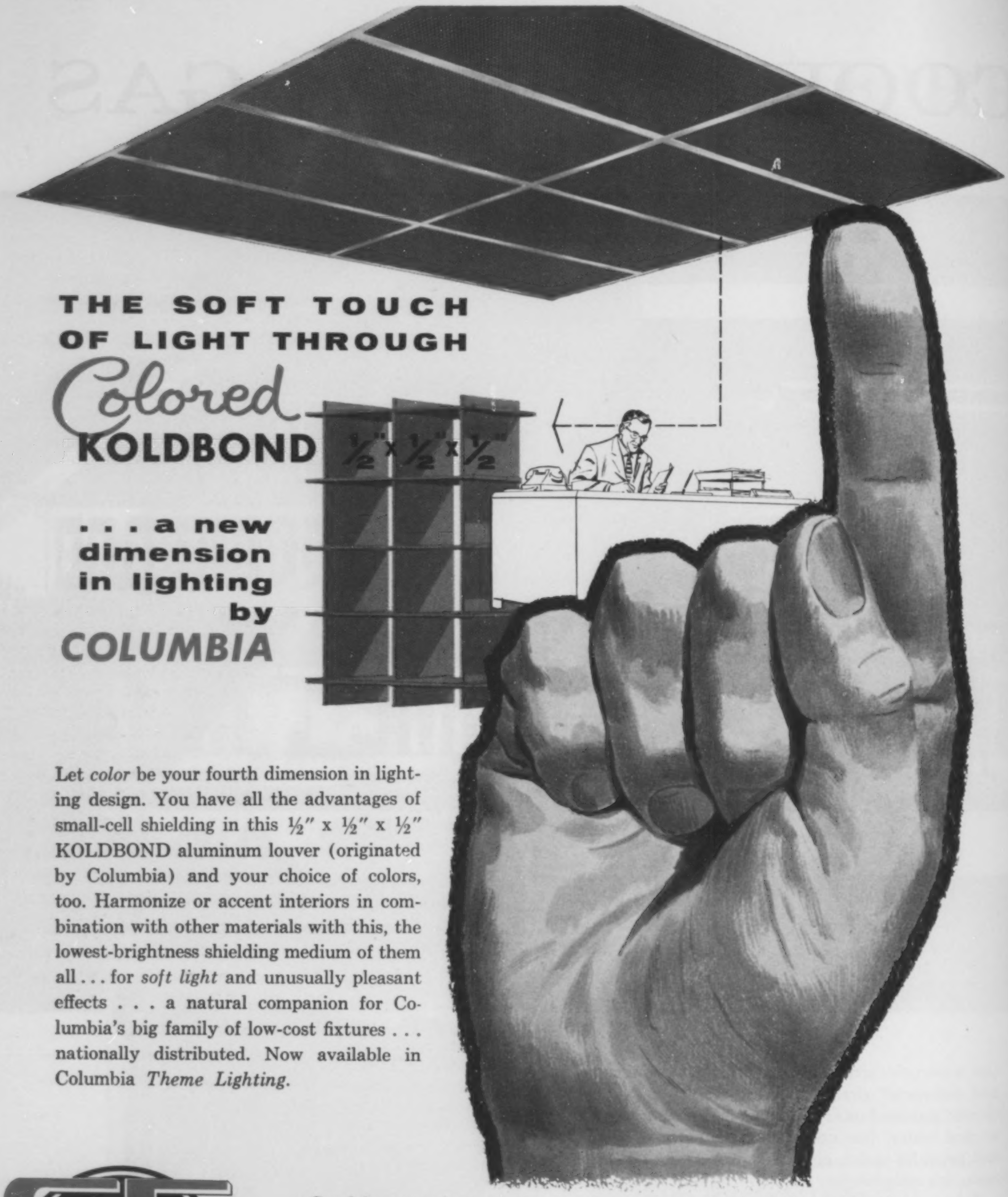

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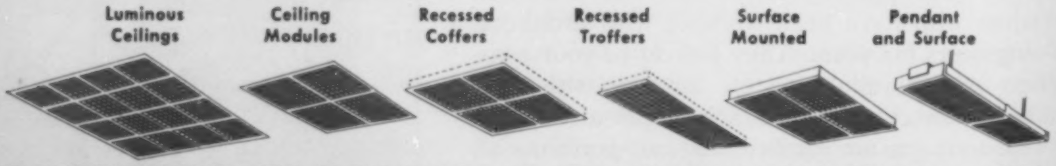

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# First quarter building figures cause downward revision of 1958 total construction estimates

Perhaps the most surprising thing about building in the first quarter of 1958 was that, despite the unexpected sharpness of the business recession, the construction figures were not really bad at all. As one economist put it: "The first quarter was good—but disappointing."

Total spending for new construction was actually up 3 per cent as compared with the first quarter of 1957 (in current dollars) and March spending was 2 per cent better than March 1957. Total private spending in the first quarter was 1 per cent higher than in the first quarter of 1957, while public spending was 7 per cent higher than a year ago.

Nevertheless, on the basis of first quarter figures, it now looks as though 1958 may not be quite the record-breaking building year anticipated by forecasters a few months ago.

Private nonfarm housing starts in March were off from a year ago, and were at a seasonally adjusted annual rate of only 880,000, which is the lowest rate for any month since early 1949. Builders attribute some of the slump to bad weather, some to a wait-and-see attitude toward whatever policies might be coming from Washington. Starts in March were 9 per cent below March 1957. (February starts were down 5 per cent from February 1957.)

Employment in the building industry was slightly lower than seasonal in March (down 252,000 from March 1957), but this is largely attributable to bad weather, as is the fact that shipments of building materials suppliers declined more than seasonally. Contract awards for new construction, as measured by F. W. Dodge Corp., also suffered a 10 per cent decline in February (compared to February 1957) and this follows a 10 per cent year-to-year drop in January. The decline in awards was only partly due to bad weather, and will affect future expenditures for building.

FORUM consultant Miles Colean now feels that his original forecast of an over-all rise of 3.7 per cent in dollar spending for new building "probably represents the maximum likely to be attained" this year. Since building costs generally have been rising, this means that the physical volume of building will be, at best, the same as in 1957. And even this forecast is predicated on Colean's belief that there will be "moderate upturns" in both private housing and public works construction.

Big builder Henry Chandlee Turner, president of Turner Construction Co., last month predicted that construction would decline this year compared to 1957, and that there would be no real upturn until 1960.

Government building economists are also having second thoughts about the outlook for 1958. The Commerce Department is rumored to be preparing an interim report on the 1958 building picture to be released in June, and Commerce is reportedly considering paring its previous forecasts (it had predicted a 5 per cent rise in total spending for construction this year).

**Biggest disappointment: housing**

How much revamping Commerce does of its 1958 forecast will depend in part on how fast the Administration and Congress move to stimulate building as a recession antidote. An important factor in this regard is the "emergency" housing bill signed last month by the President (page 8). If that bill, particularly the $1.5-billion increase in the mortgage-buying authority of the Federal National Mortgage Assn., is implemented quickly, the pickup in new housing starts later this year could make up for the disappointing showing in new starts so far. By contrast, many experts think that most of the emergency-inspired public works projects will not show up in new expenditures for some time, and many may not add to 1958 spending and employment at all.

Government economists are reportedly worried about the fact that some

*continued on page 47*

## BOX SCORE OF CONSTRUCTION

*(Expenditures in millions of dollars)*

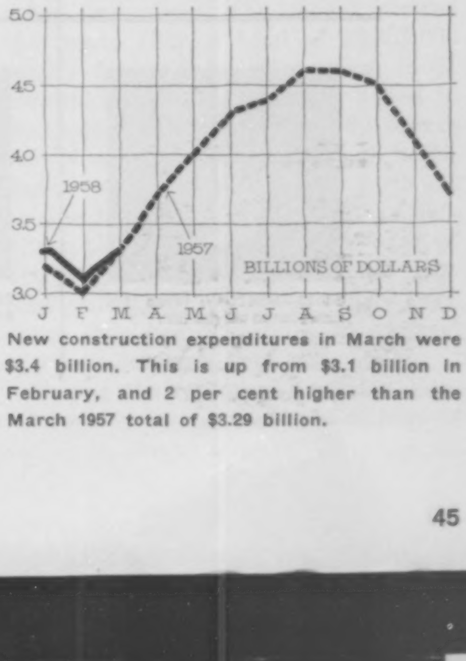
PRIVATE BUILDING

| | March | Jan.-March | | |
|---|---|---|---|---|
| | 1958 | 1958 | 1957 | ±% |
| Nonresidential ..... | 664 | 2,043 | 2,135 | —4 |
| Industrial ........ | 218 | 689 | 808 | —15 |
| Commercial ...... | 258 | 779 | 790 | —1 |
| Office buildings, warehouses .. | 156 | 472 | 411 | +15 |
| Stores; restaurants; garages | 102 | 307 | 379 | —19 |
| Religious ......... | 61 | 193 | 195 | —1 |
| Educational ...... | 40 | 122 | 124 | —2 |
| Hospital; institutions ..... | 47 | 141 | 103 | +37 |
| Residential (nonfarm) ........ | 1,168 | 3,356 | 3,342 | ** |
| Public utilities ..... | 443 | 1,263 | 1,131 | +12 |
| Total Private* ..... | 2,400 | 7,015 | 6,955 | +1 |
| PUBLIC BUILDING | | | | |
| Nonresidential ..... | 343 | 990 | 986 | ** |
| Industrial ....... | 29 | 87 | 122 | —29 |
| Educational ...... | 221 | 648 | 620 | +5 |
| Hospital; institutions .... | 28 | 72 | 74 | —3 |
| Residential ......... | 63 | 179 | 90 | +99 |
| Military ............ | 70 | 220 | 257 | —14 |
| Highways .......... | 270 | 755 | 650 | +16 |
| Sewer; water ...... | 105 | 295 | 298 | —1 |
| Total Public* ...... . | 955 | 2,727 | 2.545 | +7 |
| *Grand Total ...... | 3,355 | 9,742 | 9,500 | +3 |

* *Minor components not shown, so total exceeds sum of parts.*

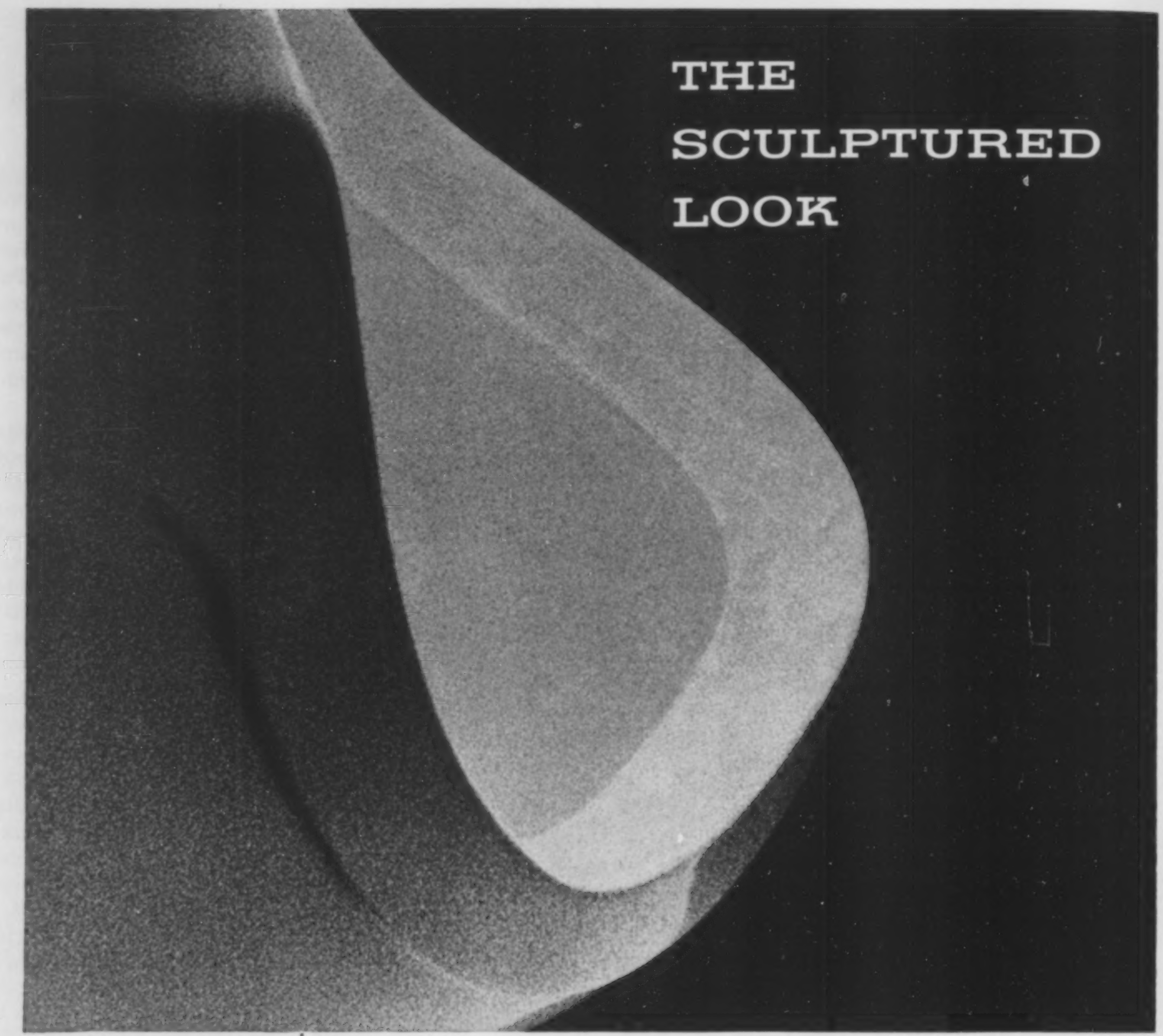
** *Less than 1 per cent.*

**SPENDING FOR NEW BUILDING**



**New construction expenditures in March were $3.4 billion. This is up from $3.1 billion in February, and 2 per cent higher than the March 1957 total of $3.29 billion.**

# THE SCULPTURED LOOK



**B3461—MILTON:** 24" x 20" vitreous china lavatory with back, 8" centers.

**B6911—LAWTON:** Vitreous china wall hung washout urinal; extended shields.

**B4012—MERCURY:** Vitreous china drinking fountain with glass filler.

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states and localities are holding off borrowing for public works because they want to get as low interest rates as possible. Even though interest rates in the municipal market have dipped in recent months (Dow-Jones index has fallen from 3.56 per cent last summer to 2.99 per cent in mid-April), the rates are still considered too high by many municipal borrowing officers, who are pushing only the most essential projects, and deferring other borrowings in hopes of still lower rates.

The biggest drags on private building in the first quarter of 1957 were industrial building—off 15 per cent from last year—and construction of stores, restaurants and garages—off 19 per cent from last year. But neither of these declines was totally unexpected. Forecasters have known all along that spending for new plant would be down this year from the 1957 peak—although the drop has been somewhat larger (8 per cent) than initially expected. And the building of stores and restaurants started turning down last year.

Perhaps the biggest disappointment, however, has been the building of private residences, which showed no increase whatever in dollar volume in the first quarter. This is important because home building is the largest single segment of the building industry. Public building is expected to continue to rise, and will probably end up with a much bigger gain over 1957 than the present 7 per cent. But if spending for new residences does not show marked improvement soon, 1958 will not only set no new spending record, but could end up lower than 1957.

There are some signs that homebuilding will pick up seasonally this Spring, but the question is, will it surpass last year by a significant amount? Despite the poor rate of new starts, March applications for FHA mortgages for future new dwellings were well above March 1957 (24,986 compared to 22,192). And there has been a good-sized rise in the number of appraisal requests from potential home buyers for VA-guaranteed mortgages. Such requests totaled 8,406 in March, compared to only 5,301 in February. But this improvement fell far short of making up for the total of 41,700 applications for FHA *plus* VA mortgages in March 1957. The emergency housing bill has reactivated the VA mortgage guarantee program for two more years, but, to date, there has not been any rush to lend money on VA mortgages, even at the new 4¾ per cent rate.

BUILDING MATERIALS

## Price cuts in aluminum, other nonferrous metals point to lower building costs

A 7.7 per cent cut in the price of primary aluminum last month was the latest—and most dramatic—evidence of price weakness in nonferrous metals. The aluminum price was cut from 26 cents to 24 cents per pound, the first reversal in the steady climb of aluminum prices for the past ten years.

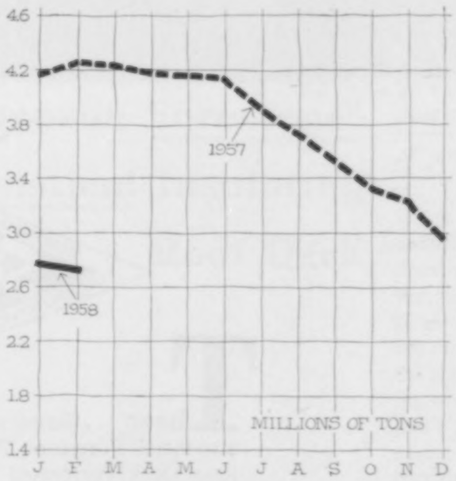
The price cut started with powerful Aluminium, Ltd., Canadian producer which, through its subsidiary, Aluminium Co. of Canada, Ltd. supplies about 12 per cent of all U.S. primary aluminum. The action was taken, according to Aluminium President Nathanael V. Davis, to "make aluminum more competitive with other materials." Unofficially, it is believed that Russian price competition in European markets, where the Reds have been selling aluminum at prices from 1½ cents to 2 cents per pound under prevailing prices of other producers, was a factor in the price rise.

U.S. producers condemned the price slash. They claimed it would not be sufficient to cause any upswing of demand for the metal, and say that it may in fact lead to even less demand if consumers figure that they can induce more cuts by holding back their orders for a few weeks.

Aluminum is not the only nonferrous metal whose price has fallen recently. Lead prices have also been cut (from 13 cents to 12 cents per pound), and zinc prices were rumored in line for a cut at mid-April. Both of these metals were effected by U.S. Government action ending stockpiling of the metals. Stockpiling of zinc stopped last month, and the government has indicated it will not stockpile any more lead after June 30. Copper, which has already dropped in price from 46 cents per pound two years ago to around 25 cents per pound recently, suffered further price shakiness last month when custom smelters cut prices back to 23 cents per pound, the lowest since 1950.

The aluminum price cut has already had some repercussions in another vital building metal market—steel. Aluminum is directly competitive with stainless steel, and the recent aluminum price cut immediately started speculation that the expected steel price increases in July (steel prices are expected to rise about $6 to $7 per ton this summer to compensate for scheduled wage increases) may not apply to stainless.

**STEEL BACKLOG**



Backlog of unfilled orders for fabricated structural steel dipped again, totaling 2,727,000 tons at the beginning of March. This was the lowest backlog figure since July 1956.

BUILDING ACTIVITY

## Demand slows for New York office space

A report and a speech focused attention last month on what is perhaps the most awesome building achievement of the post-war era — the Manhattan office building boom. The boom has been looked at before (FORUM, March 1957), but a recent report of the Real Estate Board of New York underlines its scope and vigor. The report showed that since 1947, a total of 22,351,000 square feet of new office space, in 31 buildings, have already been added in Manhattan. Another 12,806,000 square feet is under construction (in 25 buildings) and an additional 7,043,000 square feet (in 19 buildings) is definitely planned. This makes a total of over 42 million square feet of new office space in 125 buildings—more office space than has been built in the rest of the U.S. since 1947.

Taking the report as a starter, Rob-

*continued on page 48*

# Trends

cont'd

ert H. Byrne, a senior vice-president of Cross & Brown, leading Manhattan building management firm, recently gave a speech that is causing builders and building managers some uneasiness, however. Byrne pointed out that in the next four years, an average of only 1,375,000 square feet of new rentable office space will come on the market each year. This is well below the 3,133,000 square feet per year that has been completed in the last four years, which indicates how much the boom has slowed down. But Byrne is less concerned about the slowdown in building than about the slowdown in *renting* of new space. "For the past six months," he said, "there has been, with one or two exceptions, a slight slowing down in the renting of space in the new buildings, with the higher priced tower floors somewhat more difficult to move."

Byrne feels that the problem of renting new space is not one to "justify pessimism or lack of confidence." He did raise one warning however: "The realities of today's business outlook should caution the promotion of additional new office structures except by the most experienced builders in the city's prime locations."

Byrne summed up his outlook for New York office building like this:

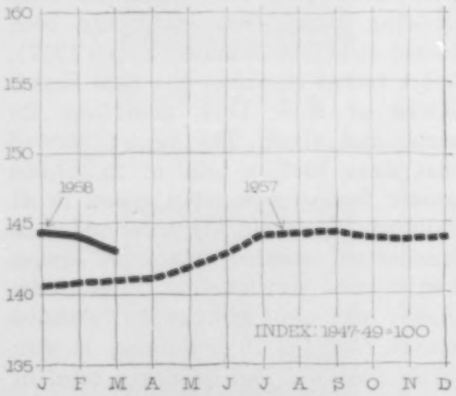
▶ New York is not overbuilt.

▶ As a result of the recession, the tempo of renting space in new structures has slowed down slightly.

▶ The sales effort to interest tenants in leasing quarters in new buildings will become more competitive.

▶ Rental rates will remain firm although other inducements such as term of leases, improvements, and subdivision of space may be offered.

**BUILDING COSTS**



**Building costs, as measured by the E. H. Boeckh & Associates index, dropped for the second consecutive month in March, to a low since last June. At 143.1 (1947-49=100) the index was 1.2 points below last September's high, but still 2.2 points above a year ago.**

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Badham Insulation Co., Inc., Birmingham
Shook and Fletcher Insulation Company, Birmingham
Stokes Incorporated, Mobile

**ARIZONA**
Fiberglas Engineering & Supply, Phoenix
Hall Insulation & Tile Co., Tucson

**ARKANSAS**
Buck Hendershott Company, Little Rock

**CALIFORNIA**
Coast Insulating Products, Los Angeles
Cramer Acoustics, Fresno and San Francisco
John K. Haas Company, San Diego
H. W. Rivett Company, Sacramento

**COLORADO**
Construction Specialties Company, Denver

**CONNECTICUT**
Wilson Construction Company, Hartford

**FLORIDA**
Anning-Johnson Company, Miami
Anning-Johnson Company, Tampa
Center Brothers, Inc., Jacksonville

**GEORGIA**
Allen Tile & Marble Co., Inc., Columbus
Anning-Johnson Company, Atlanta
Center Brothers, Inc., Savannah

**ILLINOIS**
General Acoustics Company, Melrose Park
George S. Grimmett & Co., Champaign, Decatur and Springfield

**INDIANA**
The Baldus Company, Fort Wayne
Commercial Floor Covering & Acoustics Company, Indianapolis
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**IOWA**
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**MISSOURI**
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**NEBRASKA**
Kelley Asbestos Products Co., Omaha

**NEW JERSEY**
Kane Acoustical Company, Inc., Fairview

**NEW MEXICO**
Fiberglas Engineering & Supply, Albuquerque

**NEW YORK**
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Davis-Fetch Acoustical Corporation, Syracuse
Davis-Fetch & Company, Inc., Buffalo and Jamestown
Robert J. Harder, Inc., Lynbrook, L. I.
James A. Phillips, Inc., New York
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Harold C. Parker & Company, Oklahoma City
Midwest Marble & Tile Company, Tulsa

**OREGON**
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R. L. Elfstrom Company, Salem
Johnson Acoustical & Supply Co., Portland

**PENNSYLVANIA**
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Standard Floor Company, Pittsburgh

**SOUTH CAROLINA**
Bonitz Insulation Co., Columbia

**TENNESSEE**
Alexander Marble & Tile Company, Memphis
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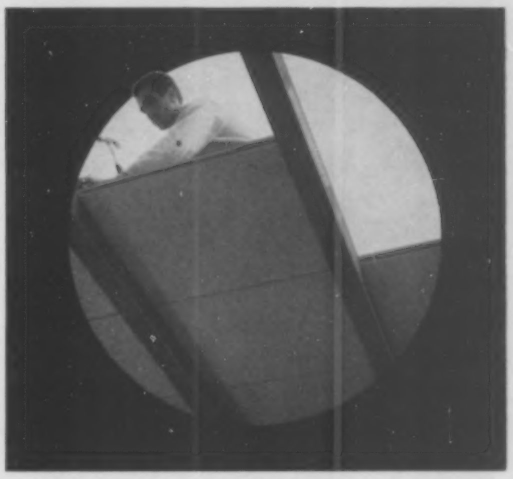

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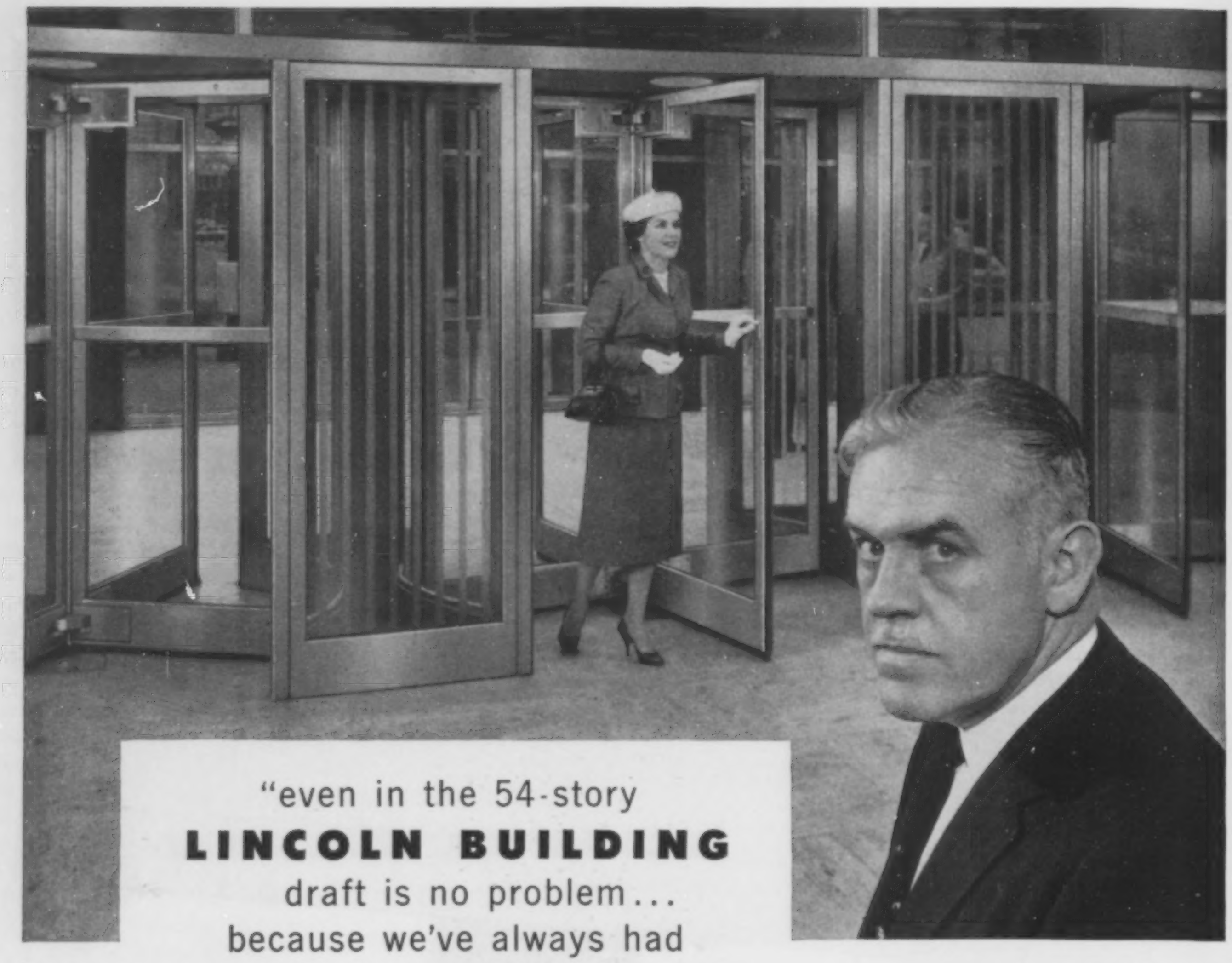

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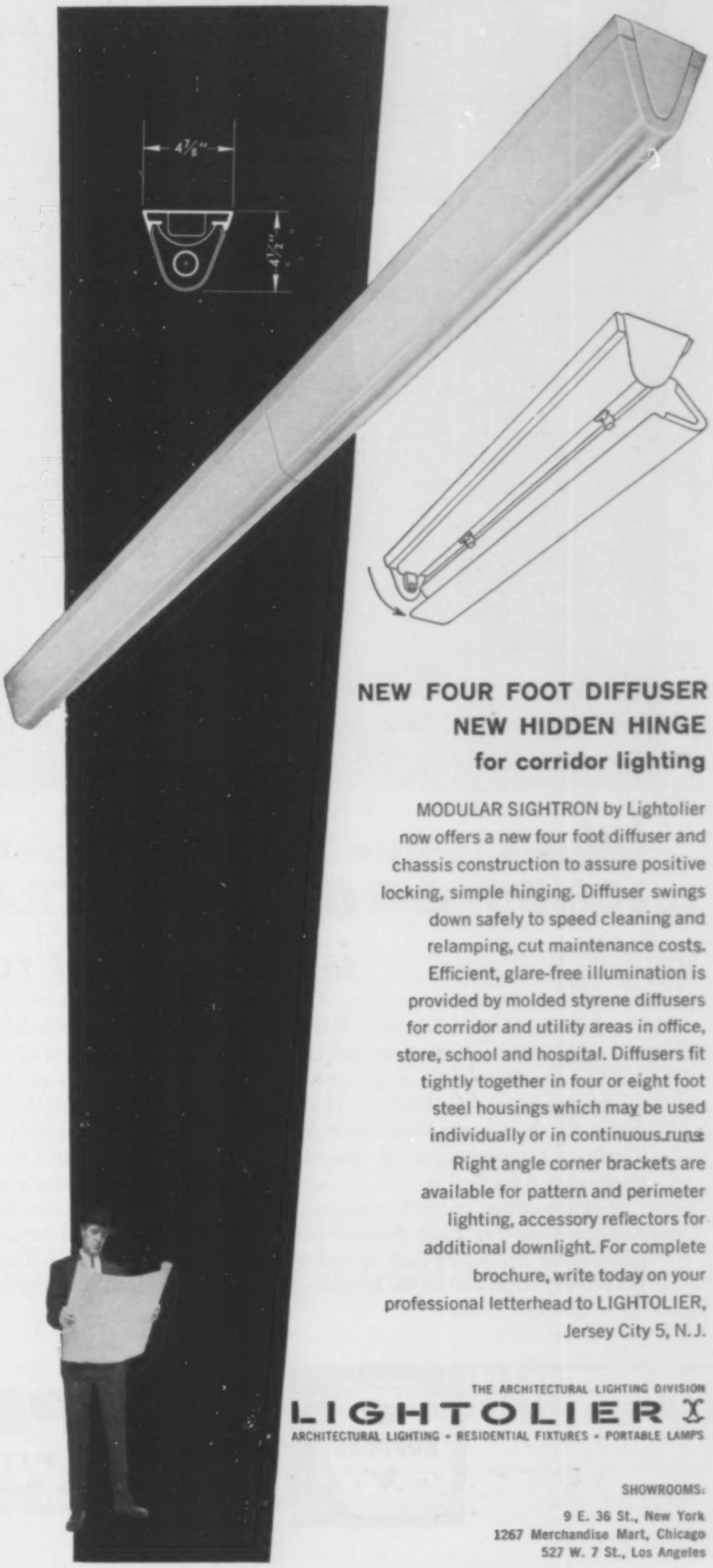

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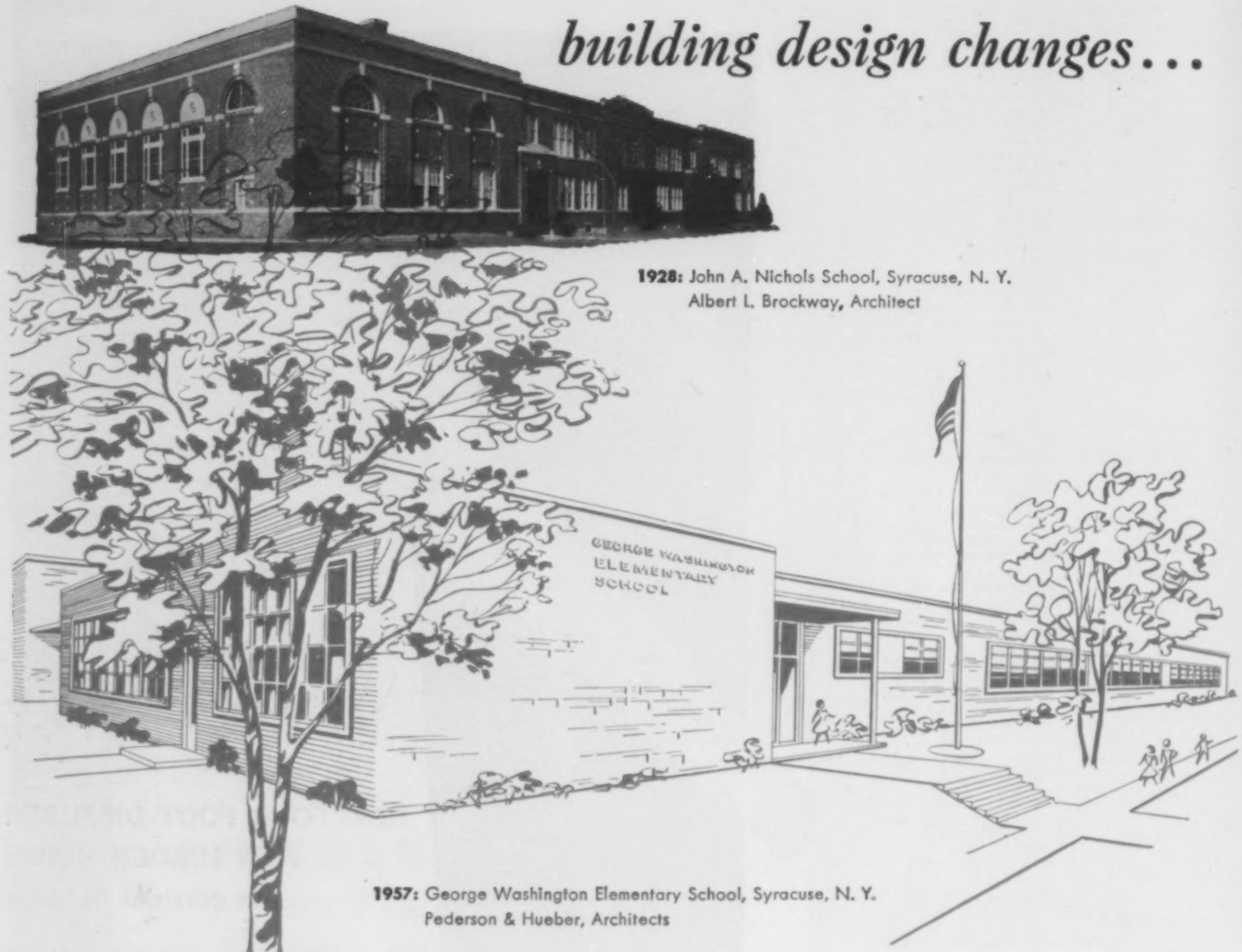

## *building design changes...*

**1928:** John A. Nichols School, Syracuse, N. Y.
Albert L. Brockway, Architect

**1957:** George Washington Elementary School, Syracuse, N. Y.
Pederson & Hueber, Architects

## *but*
## KOPPERS COAL-TAR PITCH
## *is still the best roofing material*

The John A. Nichols School in Syracuse, N. Y., was an expression of the latest thinking in school architecture when it was constructed in 1928. In marked contrast is Pederson & Hueber's recent design for the George Washington School, since it reflects the modern trend toward functional, single-story construction.

Building design certainly changes . . . but the Koppers Coal-Tar Pitch Roof is still acknowledged as the top-quality built-up roof by architects the country over. Just as the Koppers flat roof on the Nichols School has outlived its 20-year bond by 9 years, so can clients throughout the country testify to the long, trouble-free performance of coal-tar pitch roofing materials. It's the outstanding waterproofing and self-healing properties of coal tar that make this kind of service possible.

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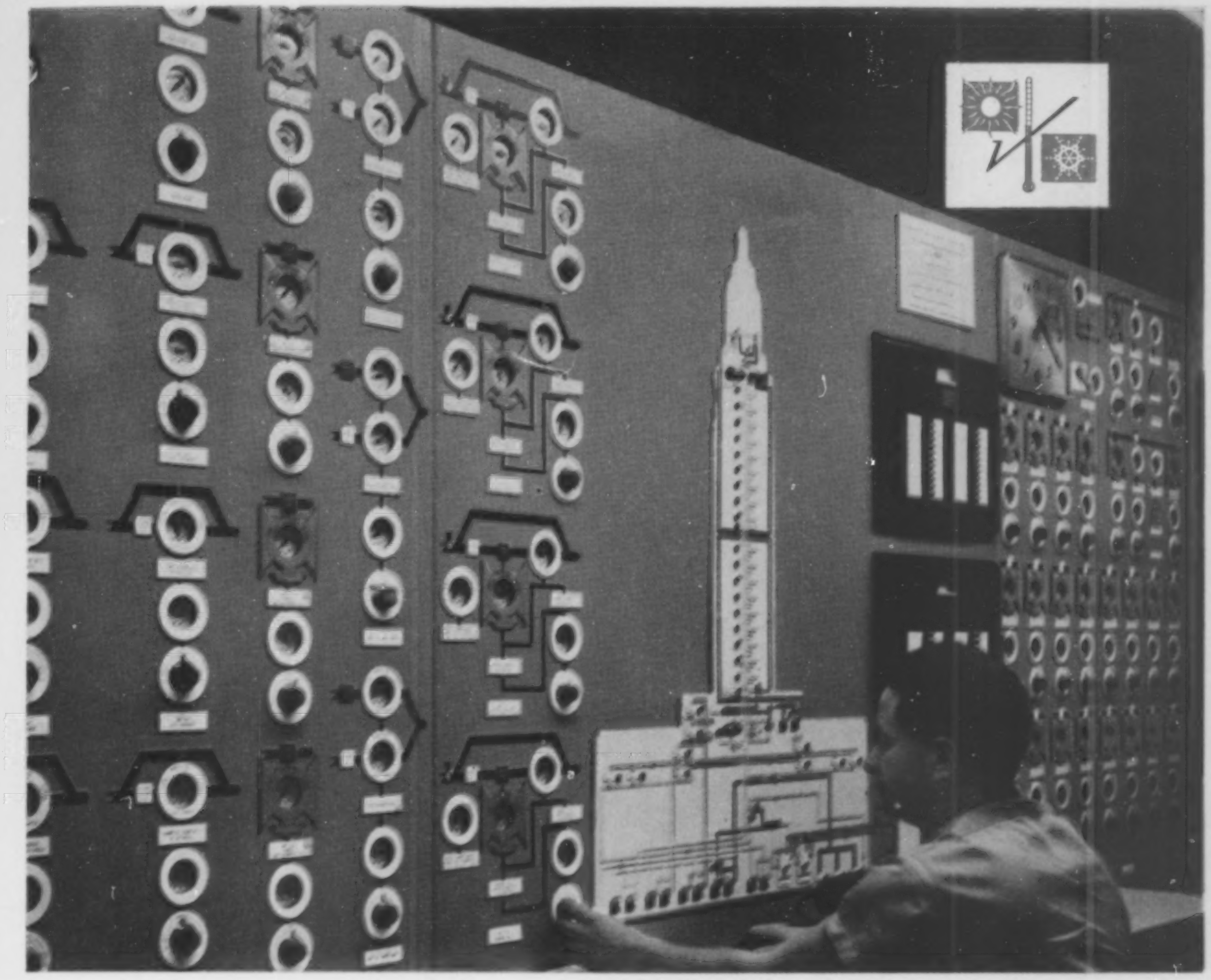

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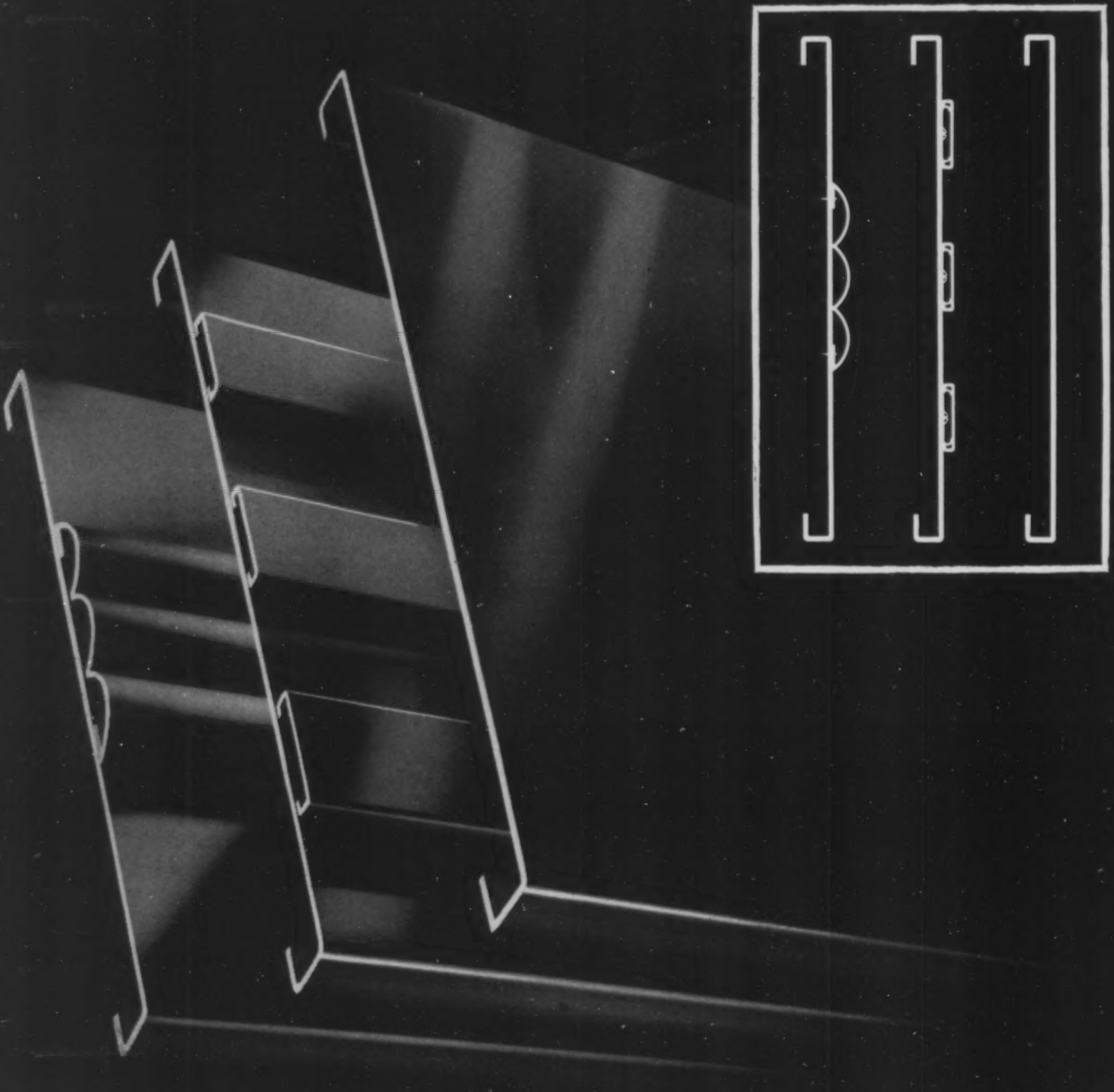

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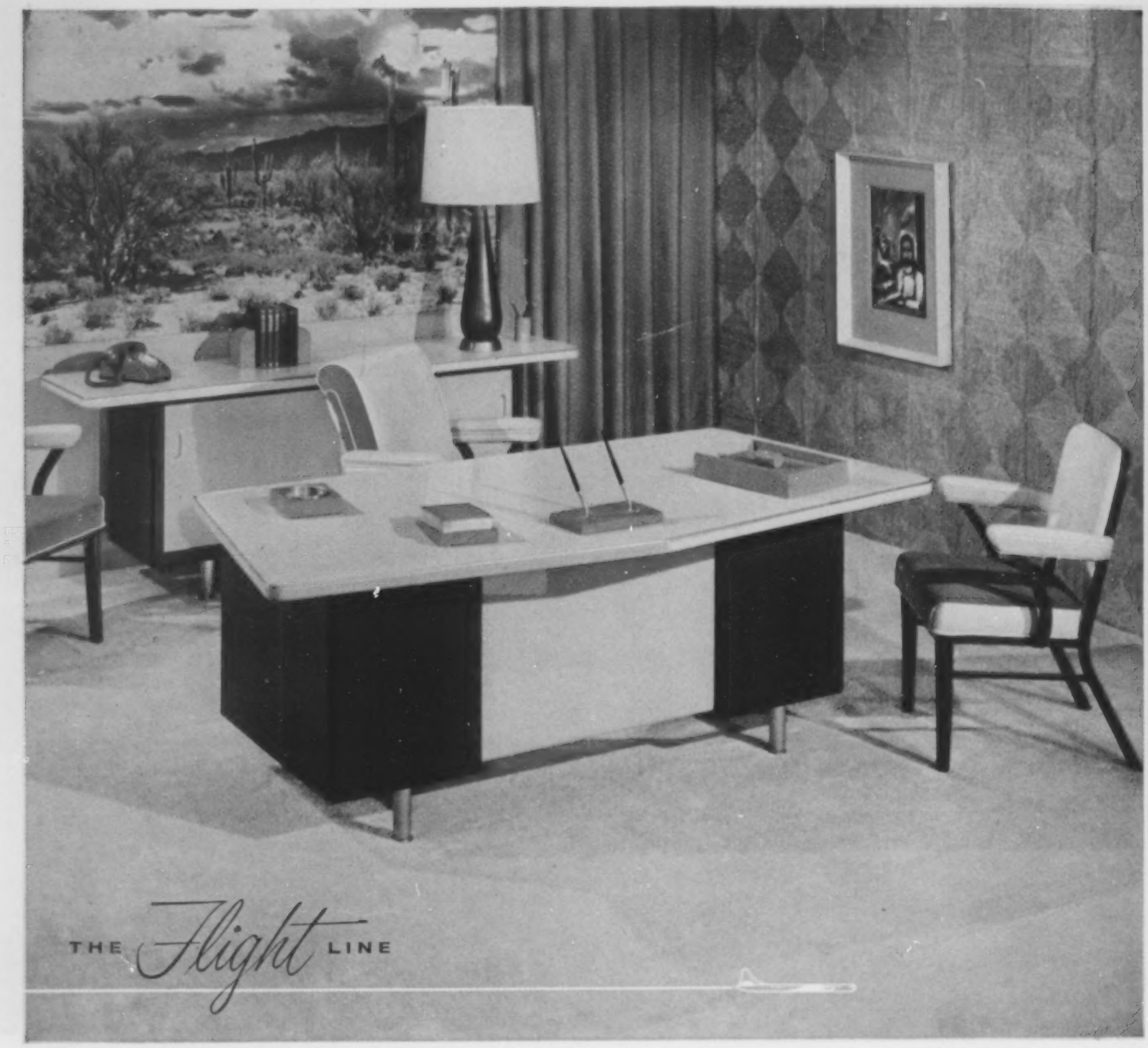

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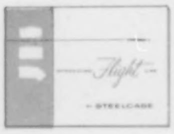

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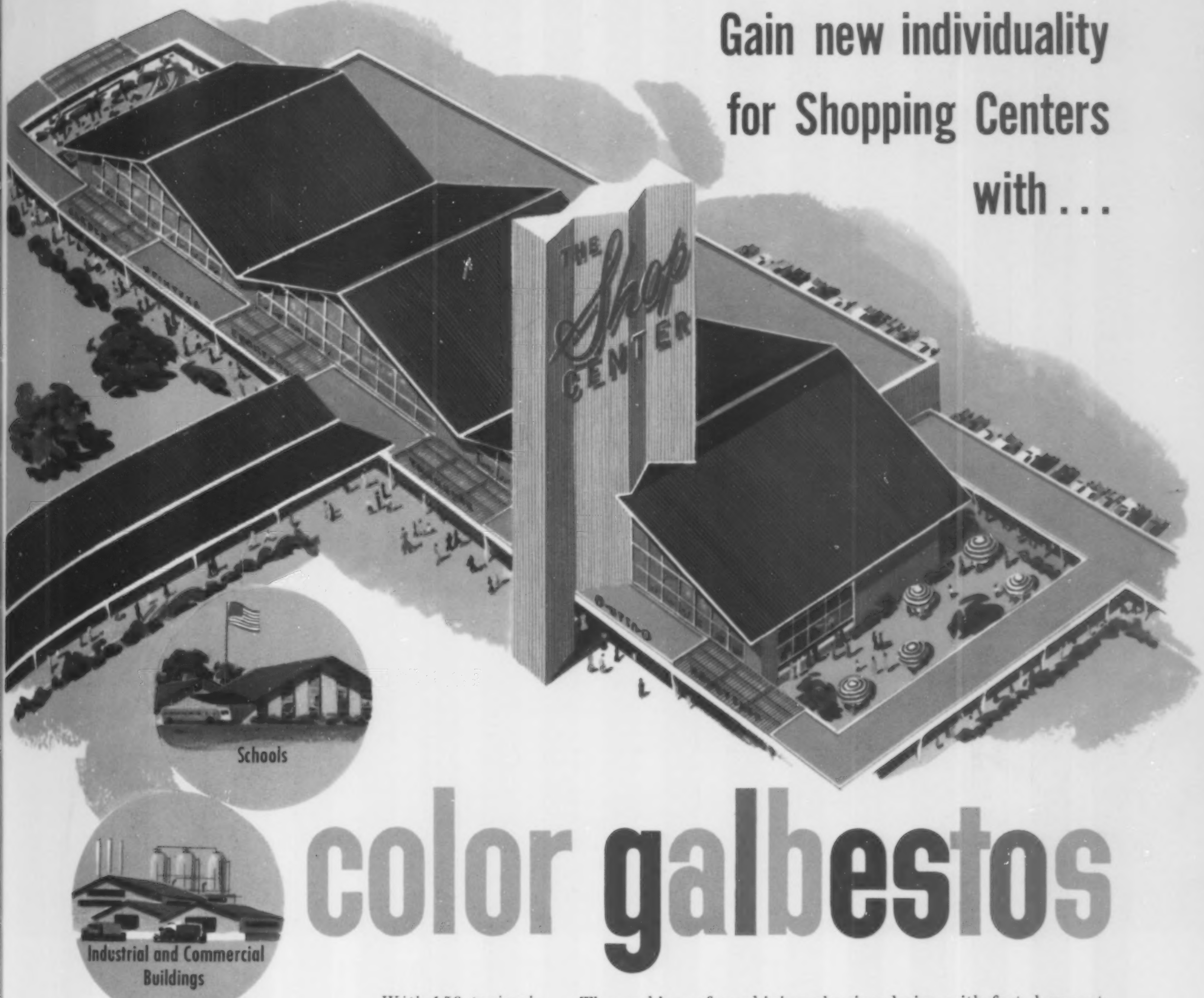

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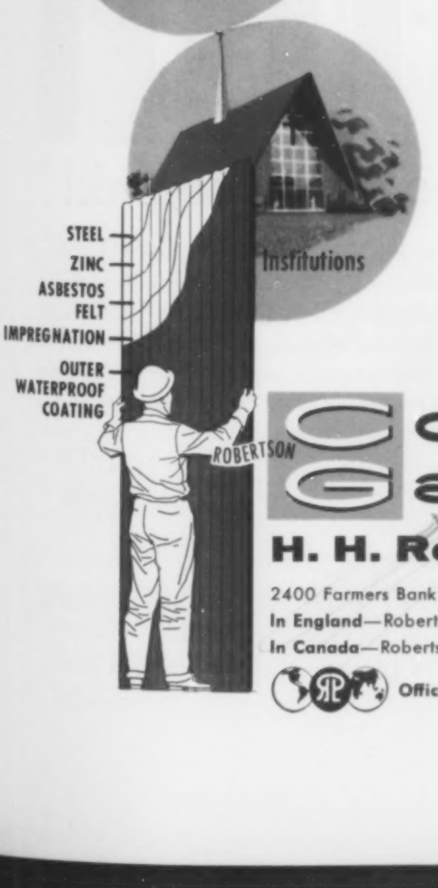

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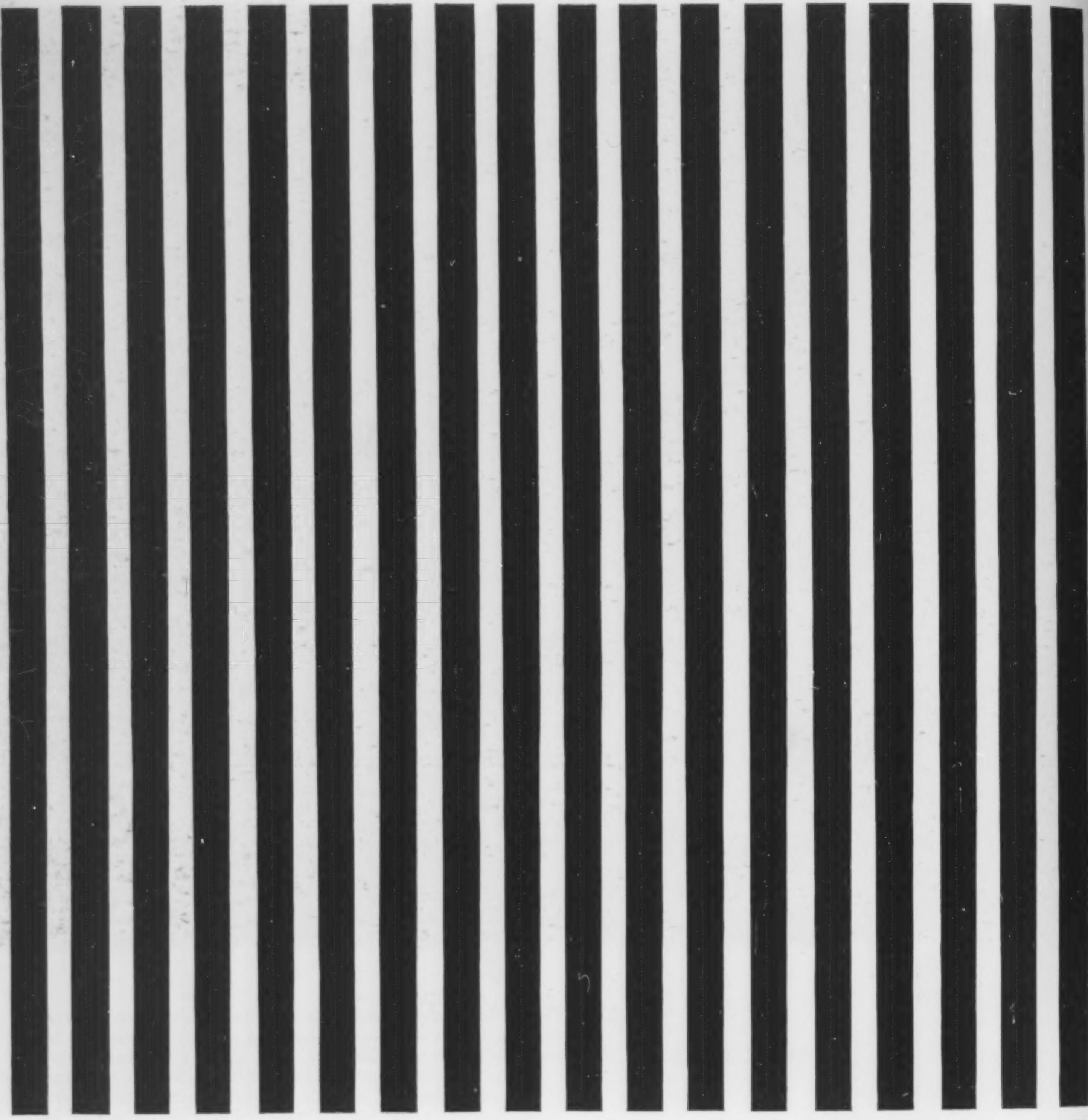

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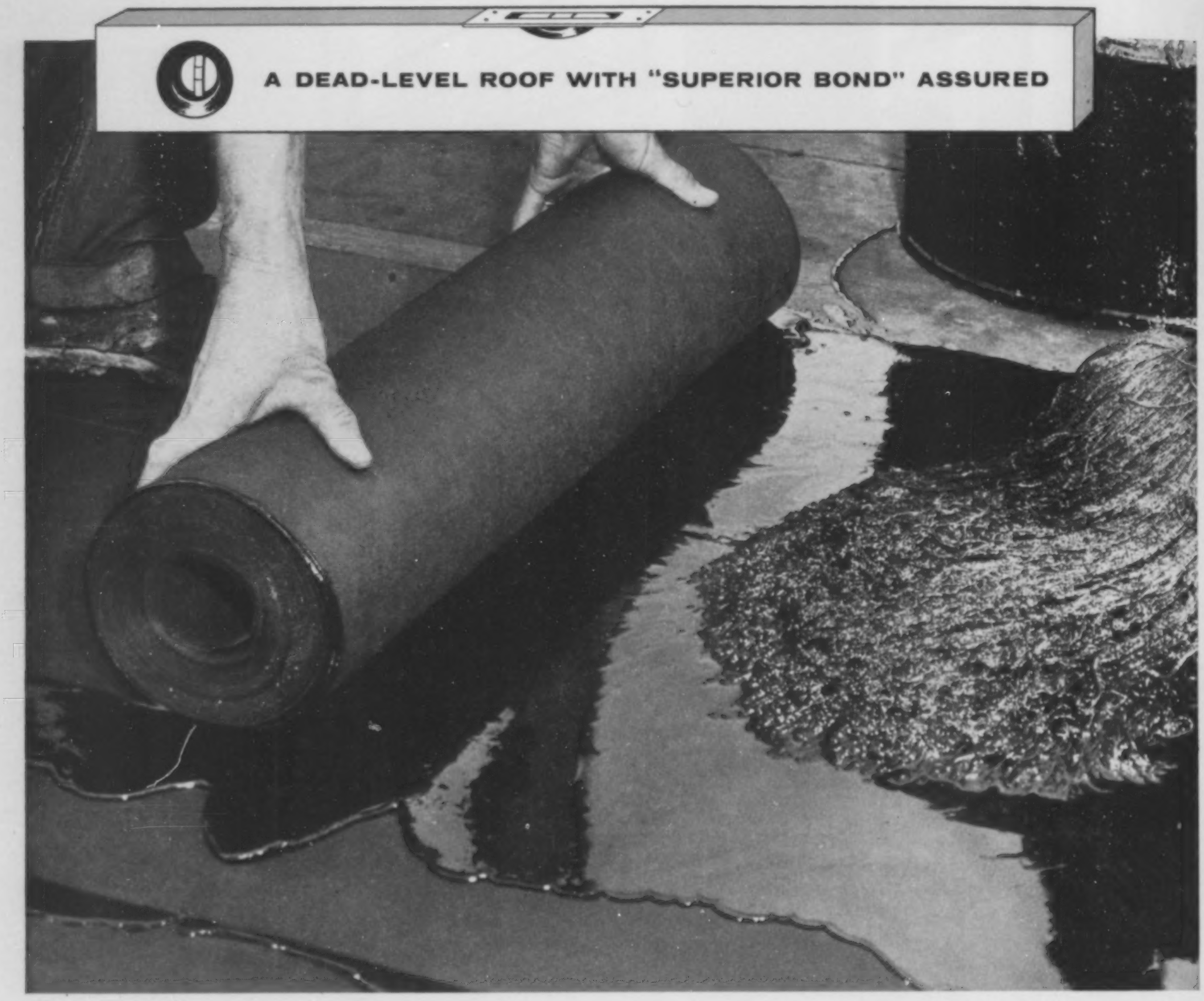

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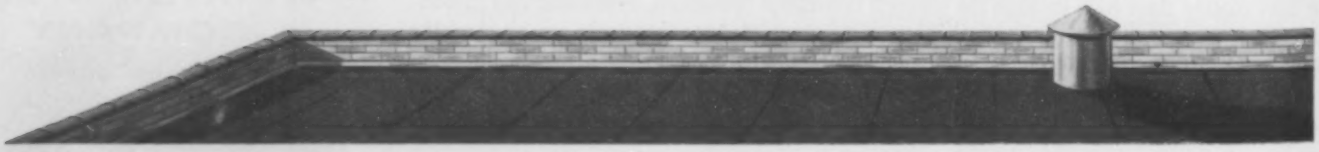

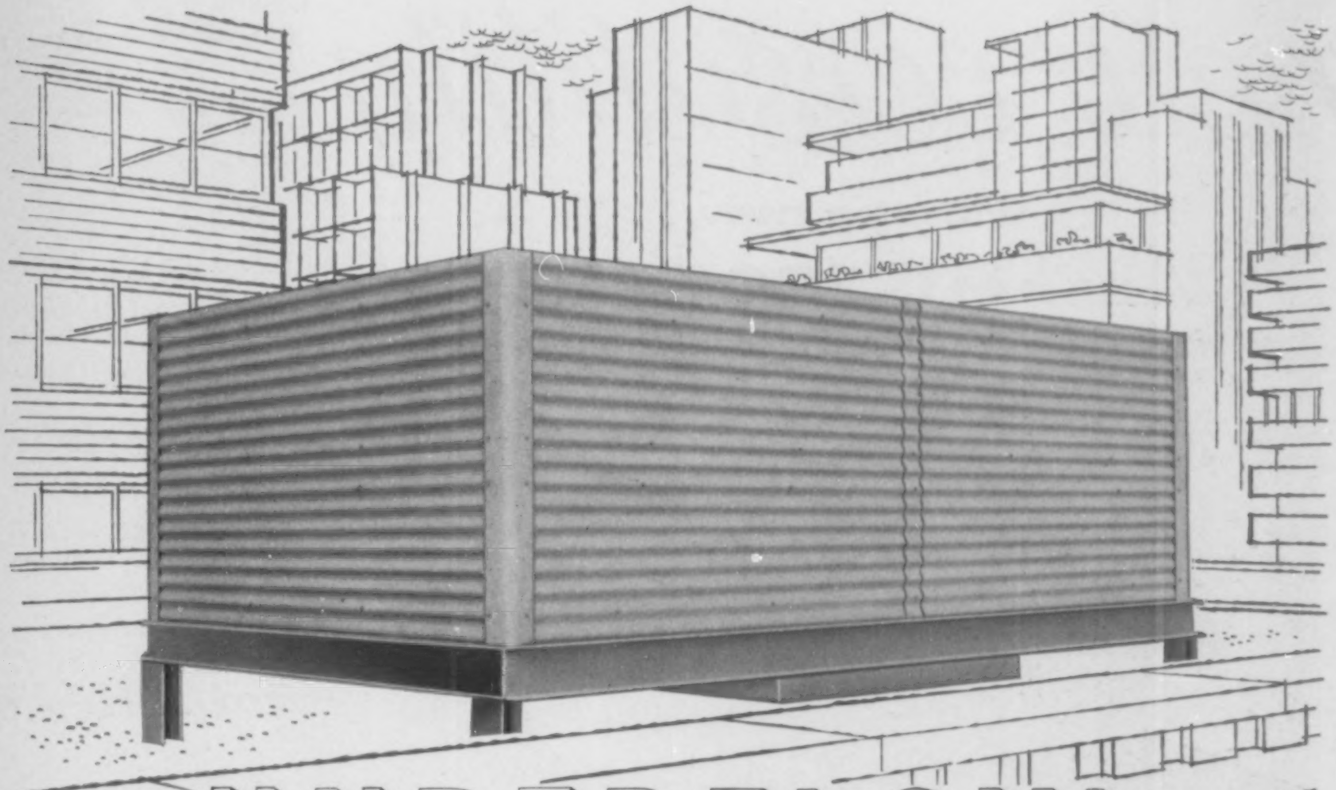

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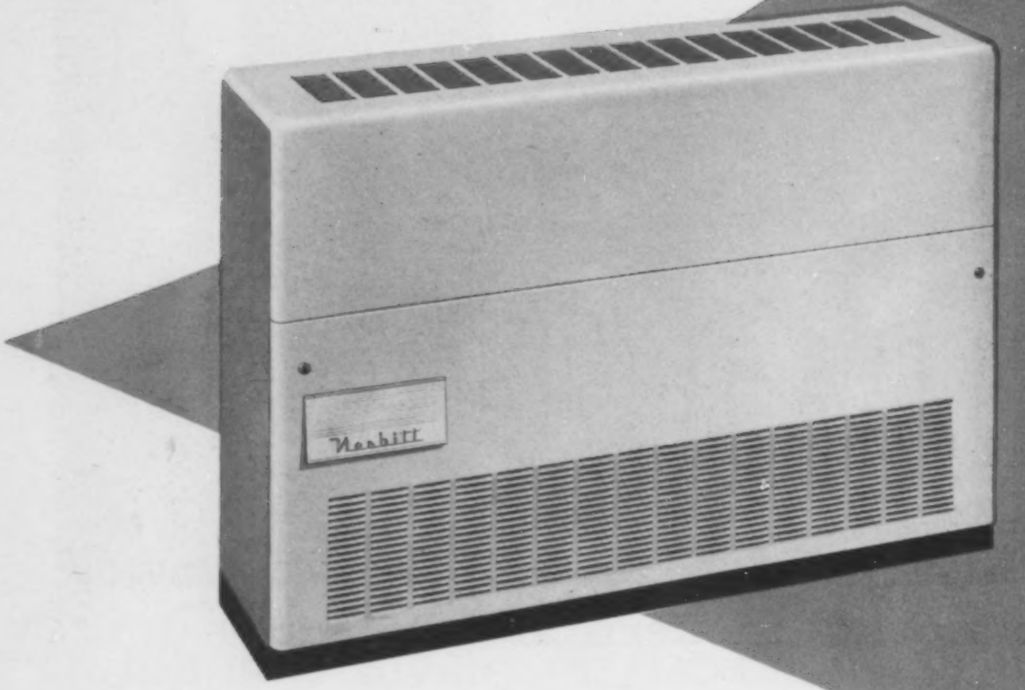

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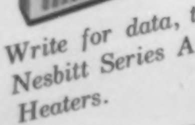

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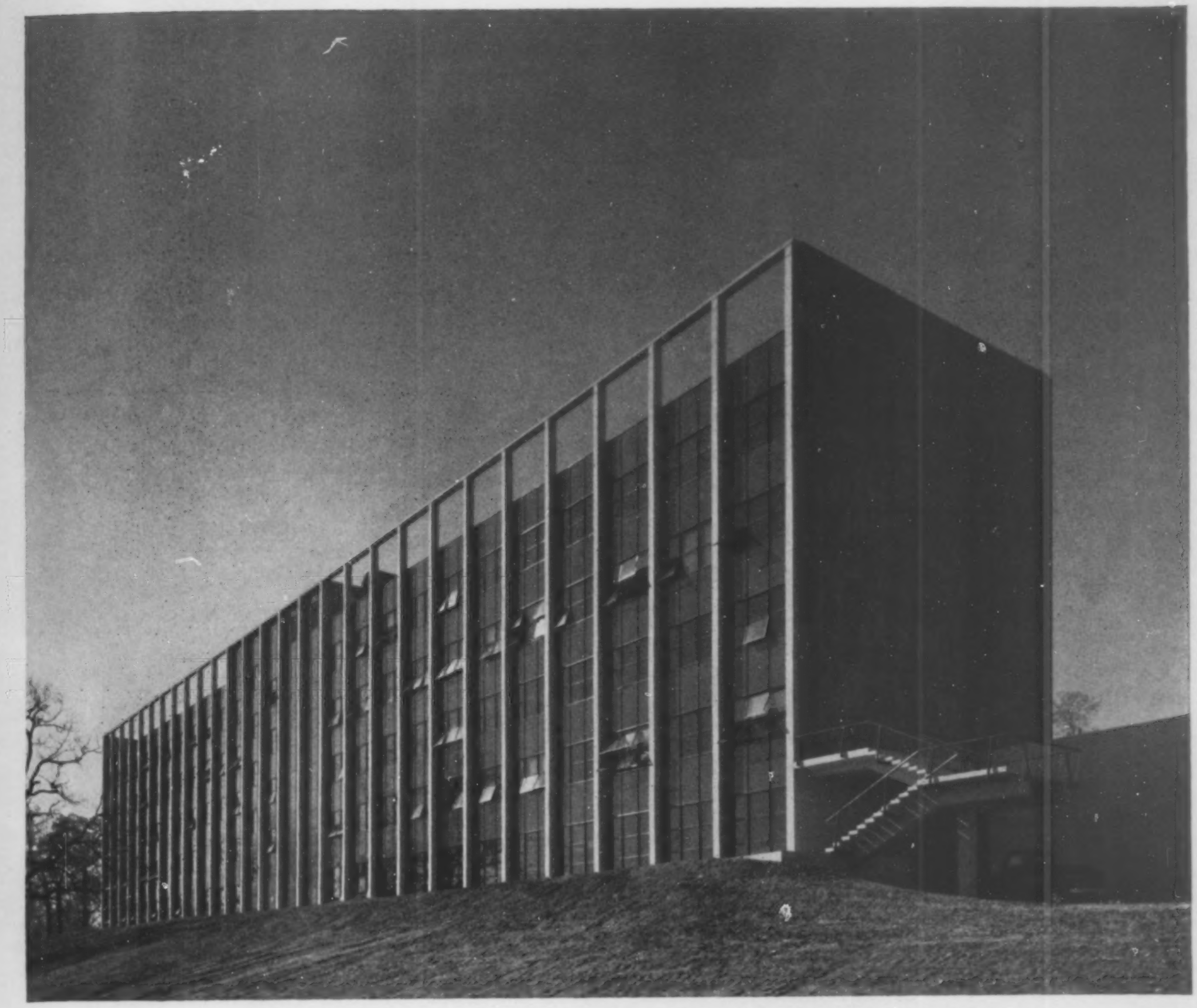

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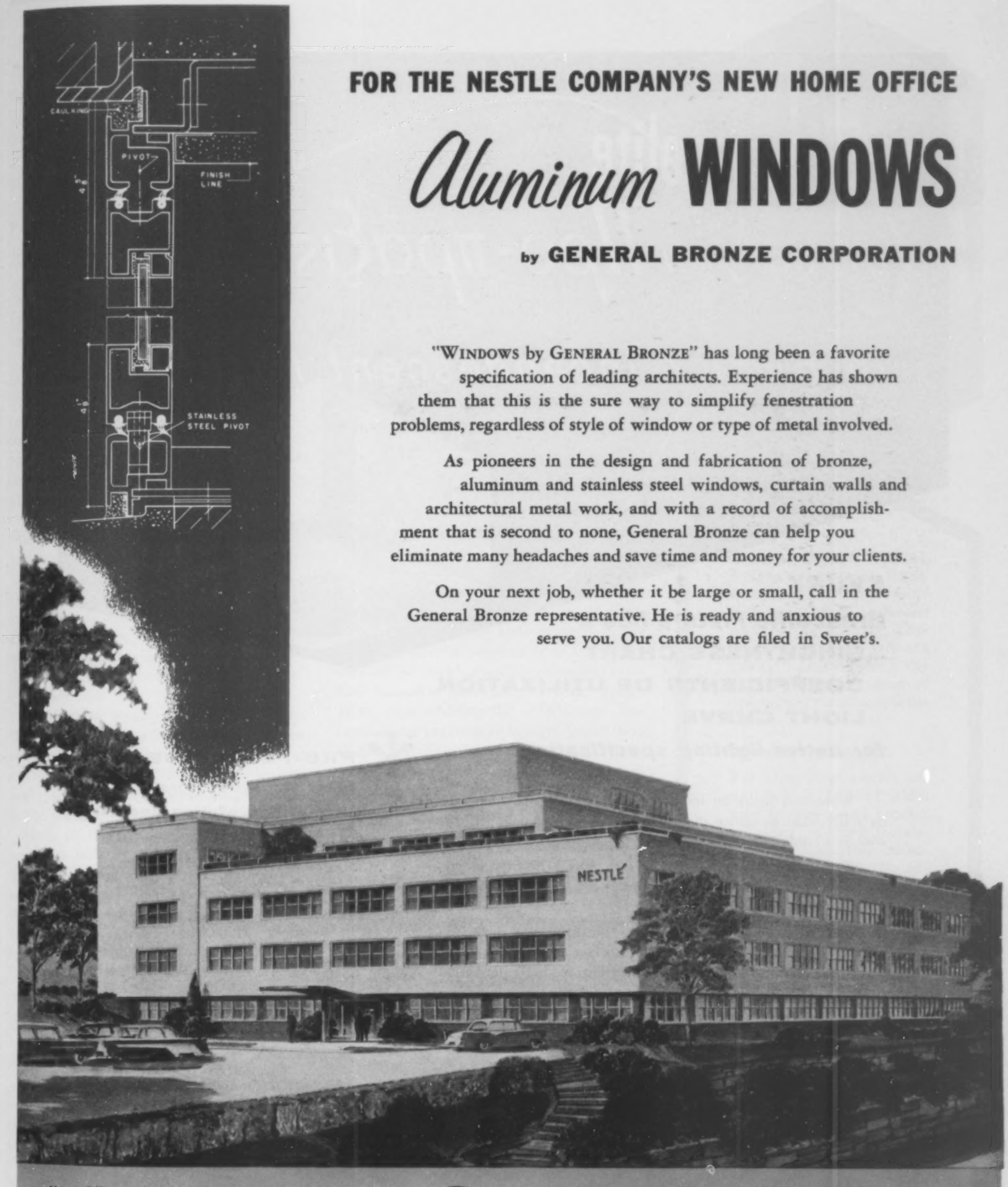

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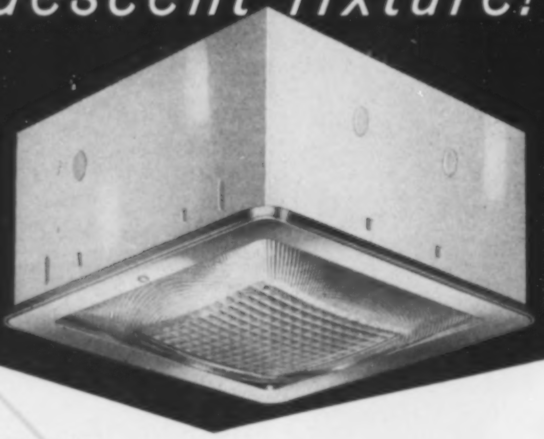

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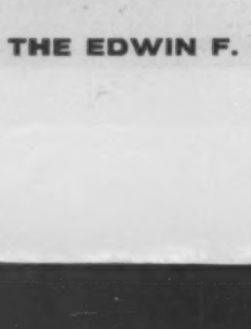

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## Reader comment on recent issues

### PACKAGE DEALS

Forum:

Your article on the package dealer (FORUM, April 1958) hints, if it does not actually recommend, that the architect should work in alliance with a contractor.

On occasions when the client preselects the architect as well as the builder and instructs them to work together there is no reflection upon the architect's professional identity. This, however, is a situation which has to be created by the client. The architect is rarely in position to suggest it—perhaps never.

If the architect and the builder enter a liaison in advance for the purpose of propositioning the client jointly, the story is different. The architect would become known as that particular builder's man, and he would find it hard to obtain competitive bids on any work that he may subsequently do on his own, nor would clients engage him if they wanted completely unbiased services.

The builder would become known for "keeping" an architect and would be scratched from the bidders' lists of other architectural offices. Net result: the two might as well marry instead of just going to bed together—and no doubt soon would.

Since, of the two, the contractor would make the bulk of the profit on the joint jobs, it seems obvious that he would dominate the partnership to begin with, or soon thereafter. In effect, the architect would become his employee. Thus exit the architectural profession.

ROLAND A. WANK, *architect*
*New York, N.Y.*

Forum:

I have read your article on package dealers with great interest.

We, as investment builders and experts in the field of creating rentable office space, practice the packaging theory to a great extent. We believe a "package deal" wisely chosen from a purely business point of view is of the greatest value to the ultimate user as it allows him to choose *in advance* the exact results that are important to him without the necessity of having to "ride herd" on various architects, engineers, contractors, and other experts with the hope that the final results will meet his requirements.

JOHN L. TISHMAN, *vice president*
*Tishman Realty & Construction Co., Inc.*
*New York, N.Y.*

Forum:

I enjoyed reading your article on package dealers.

The architects' approach of publicizing the "superiority" of their work versus a package job will never be effective in any important way toward the change of an owner's opinion. He must be shown facts and figures.

The package job invariably costs more than a normal operation.

R. H. TATLOW III, *president*
*Abbott, Merkt & Co.*
*New York, N.Y.*

Forum:

Are you sure the increase in volume of work done by package dealers is any greater than the increase in volume of work handled by architects and engineers in the general industrial construction field? The number of architectural-engineering firms has increased materially during recent years, thus enabling the architectural and engineering professions to serve better their clients, particularly in the industrial field.

Also, I seriously question that the package deal is the only way to save total construction time.

ROBERT F. HASTINGS, *vice president*
*Smith, Hinchman & Grylls Associates, Inc.,*
*architects and engineers*
*Detroit, Mich.*

▪ FORUM *mentioned three ways construction time can be saved: proprietary contract; joint ventures; quantity bids.*—ED.

### HOUSING POLICY

Forum:

You have done a fine job of stating what the national housing policy should be (FORUM, March 1958).

PHILIP F. TRIPP, *president*
*National Association of Housing and Redevelopment Officials*
*Chicago, Ill.*

Forum:

The President's recommendation in his budget message for a gradual percentage reduction in the federal contribution to the costs of urban renewal programs would, if followed, be a serious mistake and a real

*continued on page 66*

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blow to the redevelopment of our cities and the elimination of slums and blight. We regret that "FORUM concurs wholeheartedly with the President's goal of reducing the federal role in renewal."

Otherwise your article is excellent as a guide to the whole problem of housing and urban renewal.

GEORGE CHRISTOPHER, *president*
*American Municipal Association*
*San Francisco, Calif.*

Forum:

I am impressed by the scope and depth with which FORUM has discussed the issue. However, I must confess disappointment that one area of Congressional action was not mentioned—the need for a federal program of housing research.

MARY K. NENNO, *director of research*
*Buffalo Municipal Housing Authority*
*Buffalo 2, N.Y.*

Forum:

Your support for enactment of a real estate investment trust bill is helpful; we believe this would be a very substantial aid to the investment of private funds in urban renewal and rental housing.

NELS G. SEVERIN, *president*
*National Association of Home Builders*
*Washington, D.C.*

## OPEN LAND

Forum:

Thank you for the article "The City's threat to open land" which appeared in the January issue of FORUM.

Our Rural Advisory Committee is embarking on a pilot study program of five townships which are under different degrees of urban pressure to determine what new techniques can be developed for the preservation of "Open Space" in the rural areas of New Jersey. Your article has given us a current insight in the urban expansion problem on a national level.

VINTON N. THOMPSON, *executive director*
*Department of Agriculture*
*Trenton, N.J.*

## GOOD LOOKS AT HOME

Forum:

Your editorial "Good looks abroad—why not here?" (FORUM, February '58) proposes a major policy move to improve the architecture of domestic government buildings. To do this FORUM proposes that the government try the Department of State's Foreign Buildings Operation system at home for other government agencies.

In 1953-54 I was retained as consultant

*continued on page 68*

**Olin Aluminum**

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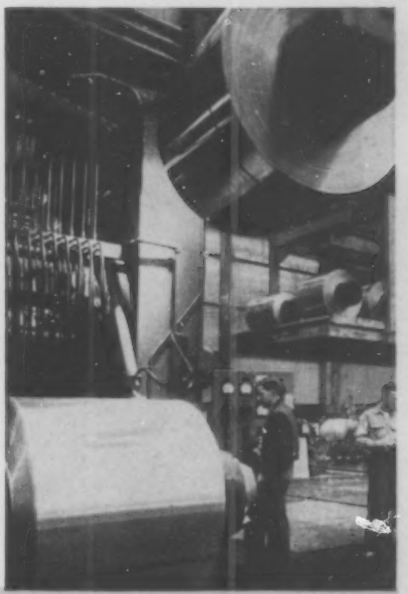

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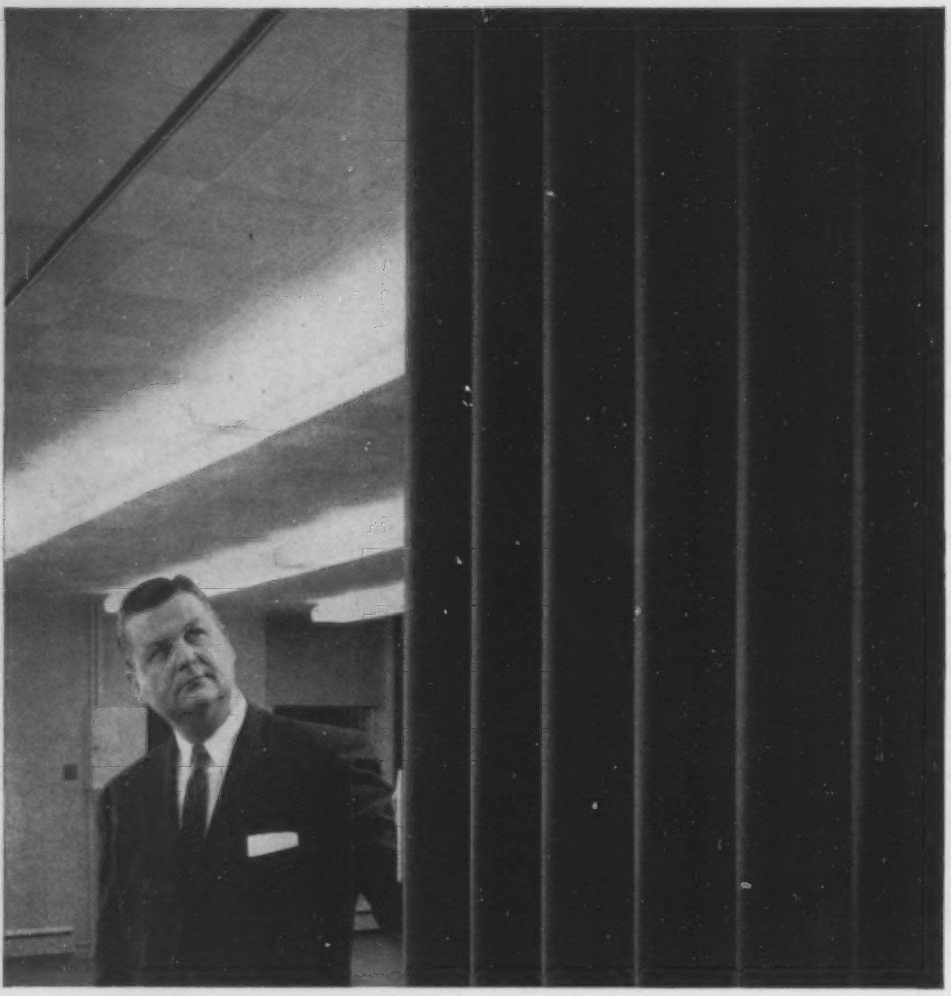

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to the Department of State, in charge of the reorganization of the Foreign Buildings Operation. This included that phase relating to design, under which the present policy and system was formulated and established. FORUM's proposal deserves the support of government, the taxpayers, and the architectural profession. The wider application of a system which selects architects "purely on a merit basis" will be a major contribution to both architecture and government.

NELSON A. KENWORTHY
*Consulting engineer*
*New York, N.Y.*

Forum:

In your February issue you say that "What distinguishes the Foreign Buildings Operation is that the State Department no longer relies solely on its own amateur judgment in choosing its architects but calls in a committee of eminent architects, who are appointed through the AIA."

The members of the Architectural Advisory Panel are not appointed through the AIA. Appointment of members of the Panel, as well as the architects who design the projects, is solely the responsibility of the Department of State.

WILLIAM P. HUGHES, *director*
*Office of Foreign Buildings*
*Department of State*
*Washington, D.C.*

▪ *Reader Hughes is technically correct; the "responsibility" is the State Department's but State quite naturally solicits suggestions for nominations from the AIA.*—ED.

END

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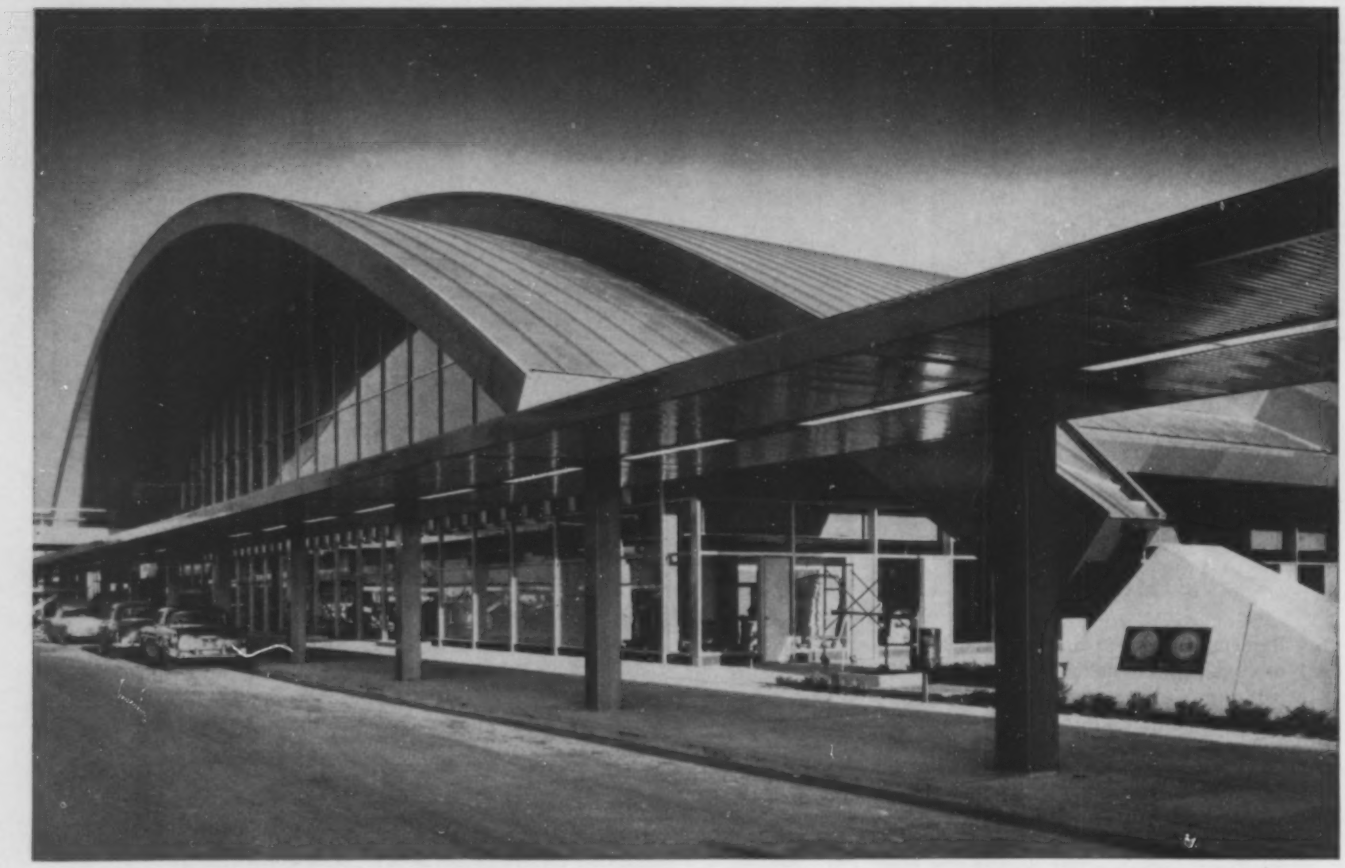

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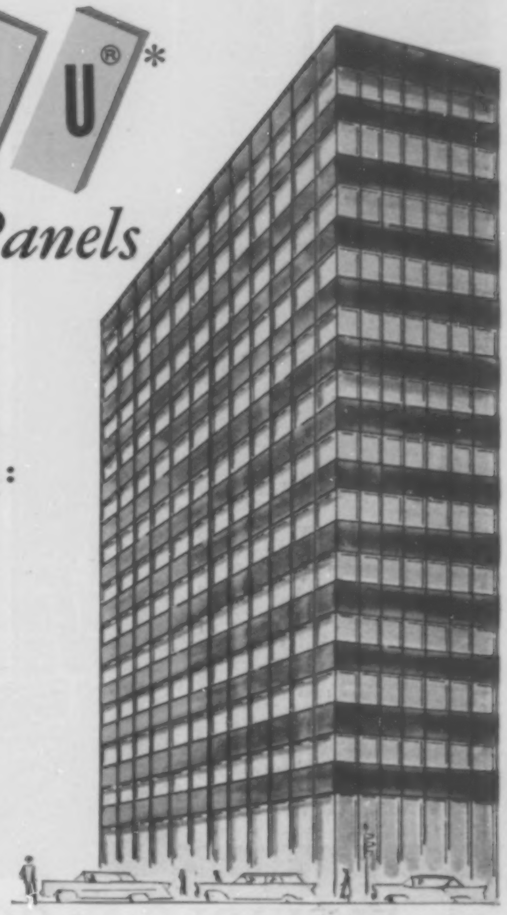

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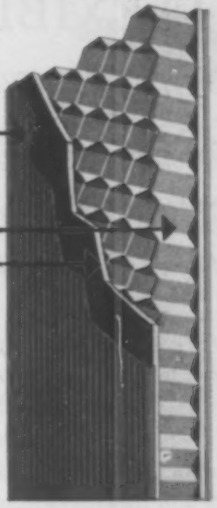

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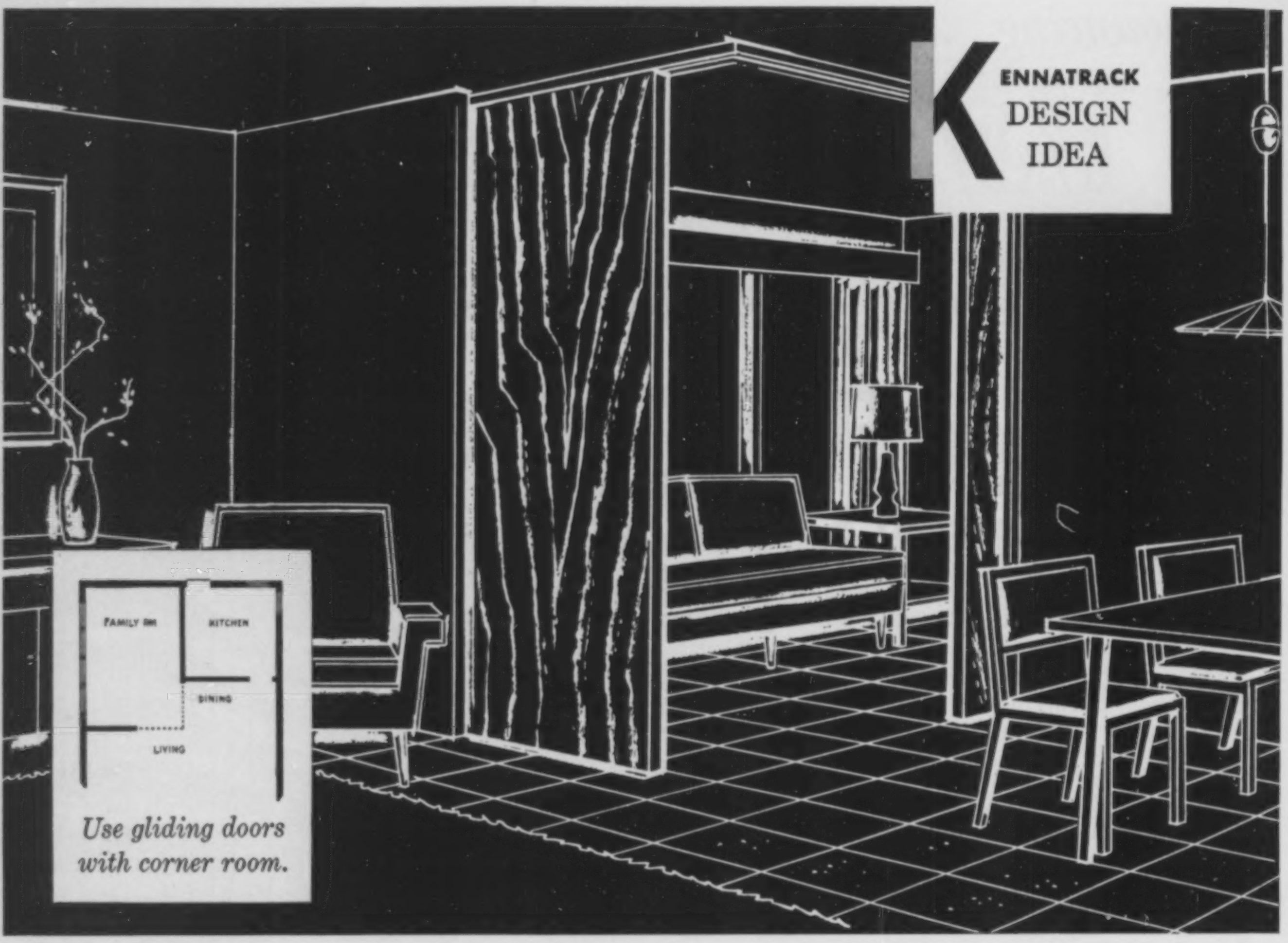

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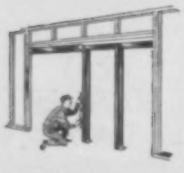

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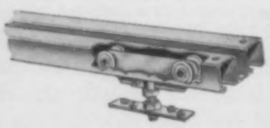

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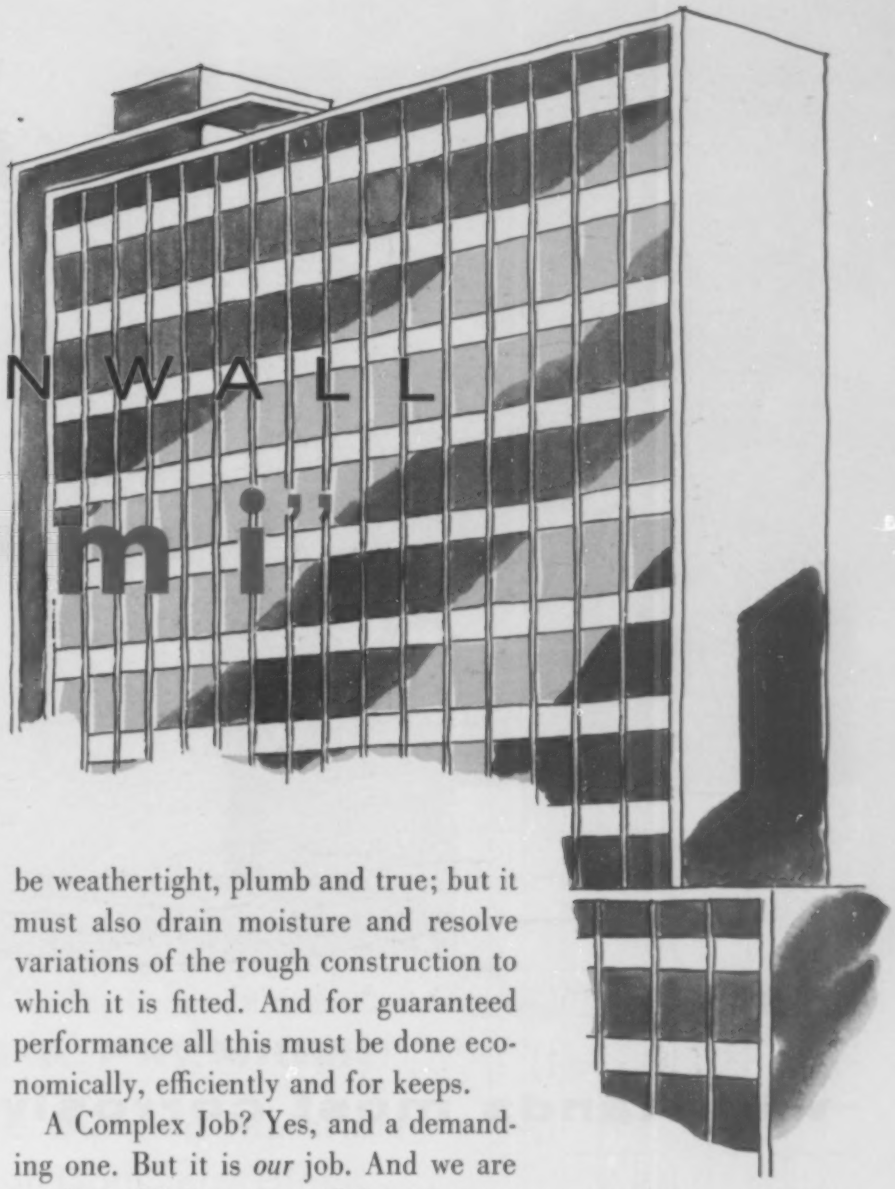

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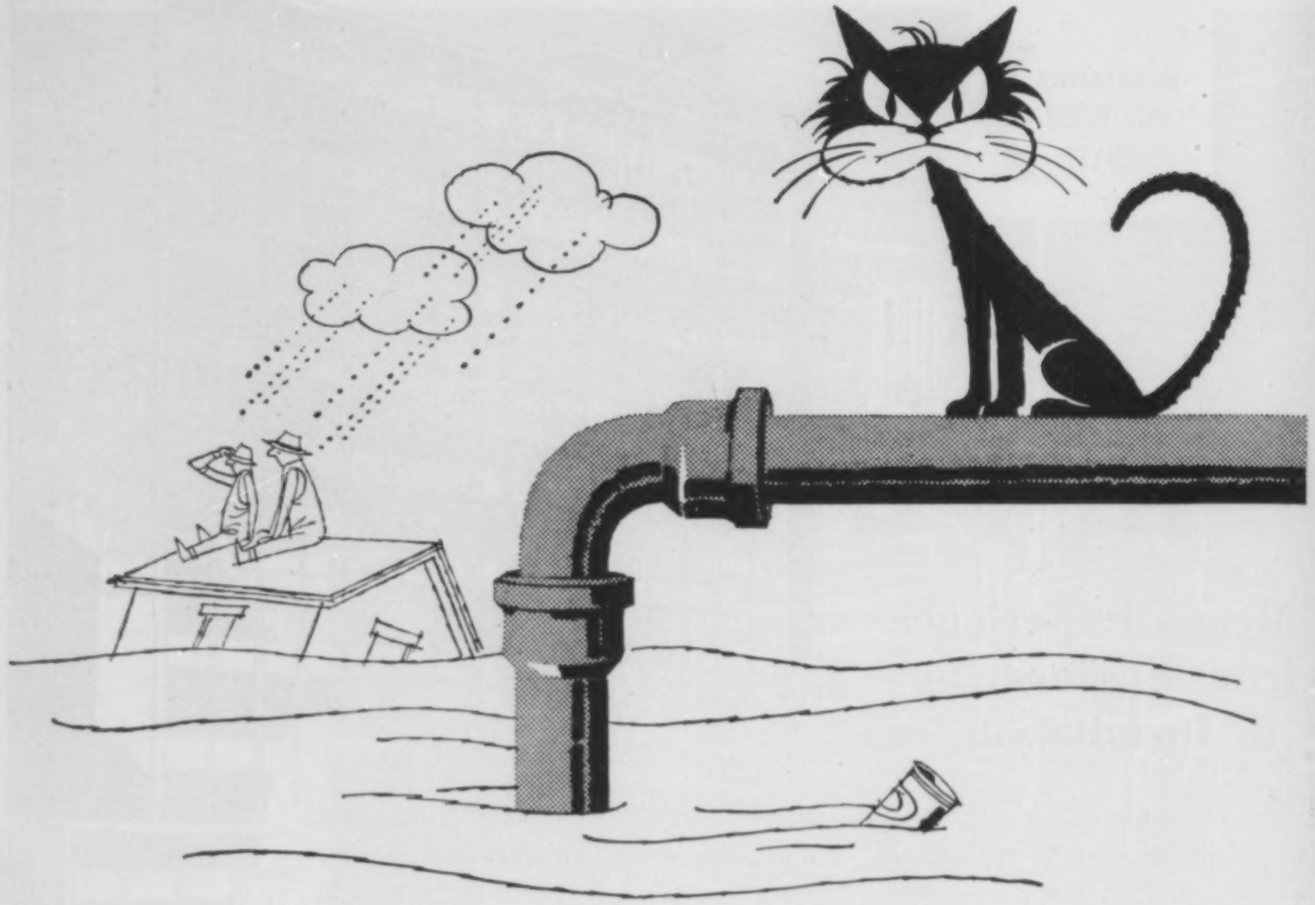

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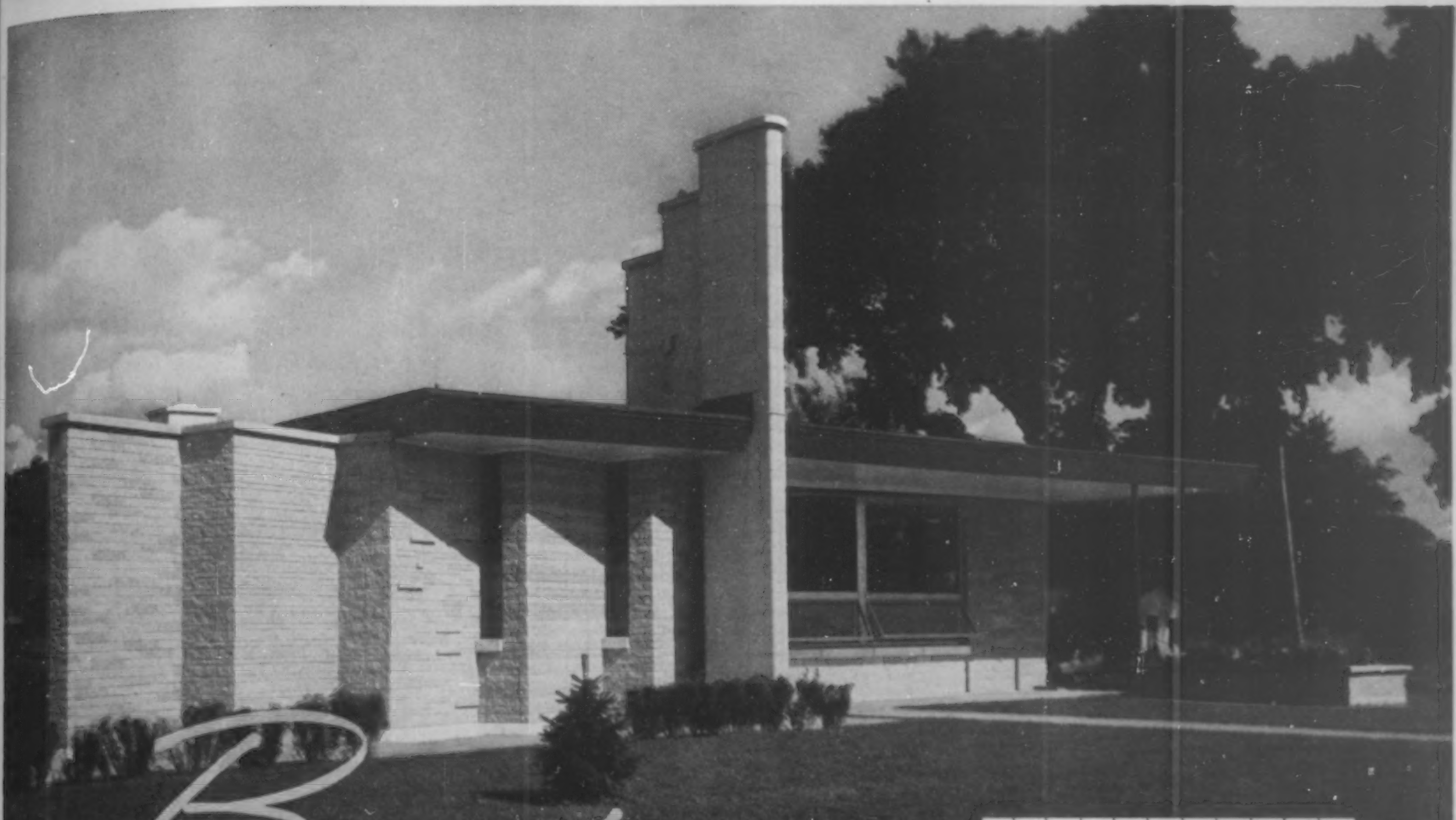

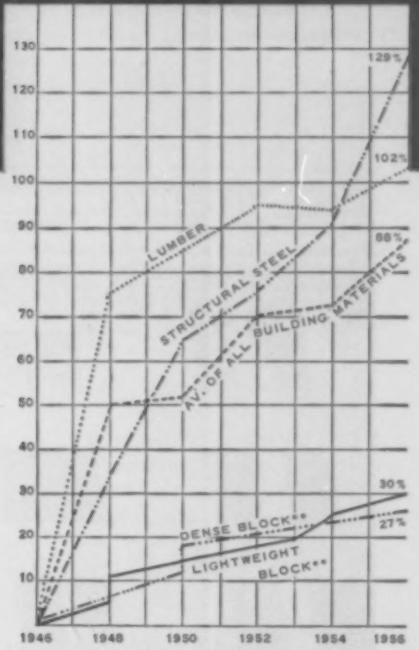

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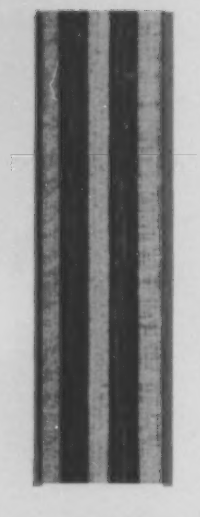

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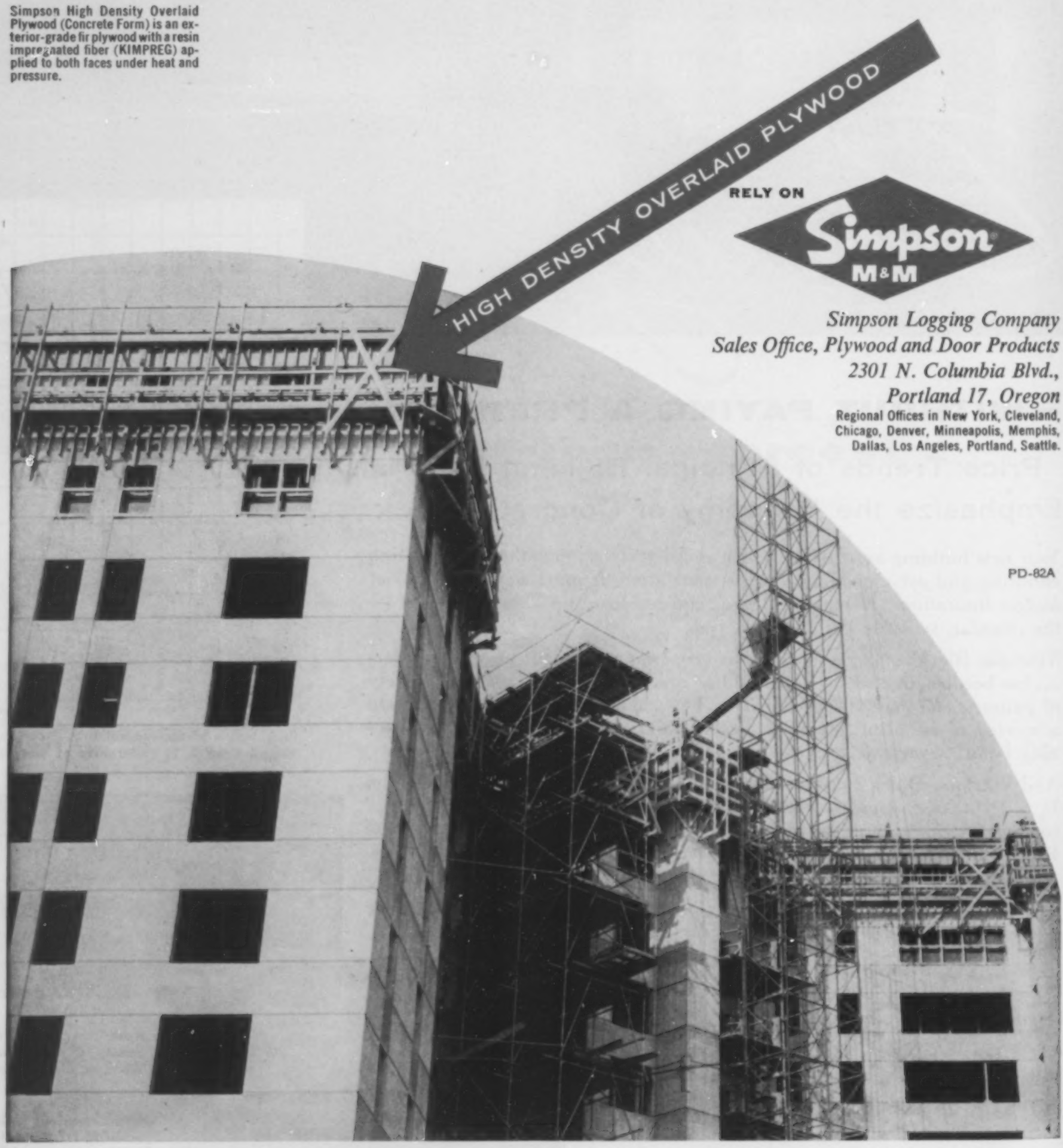

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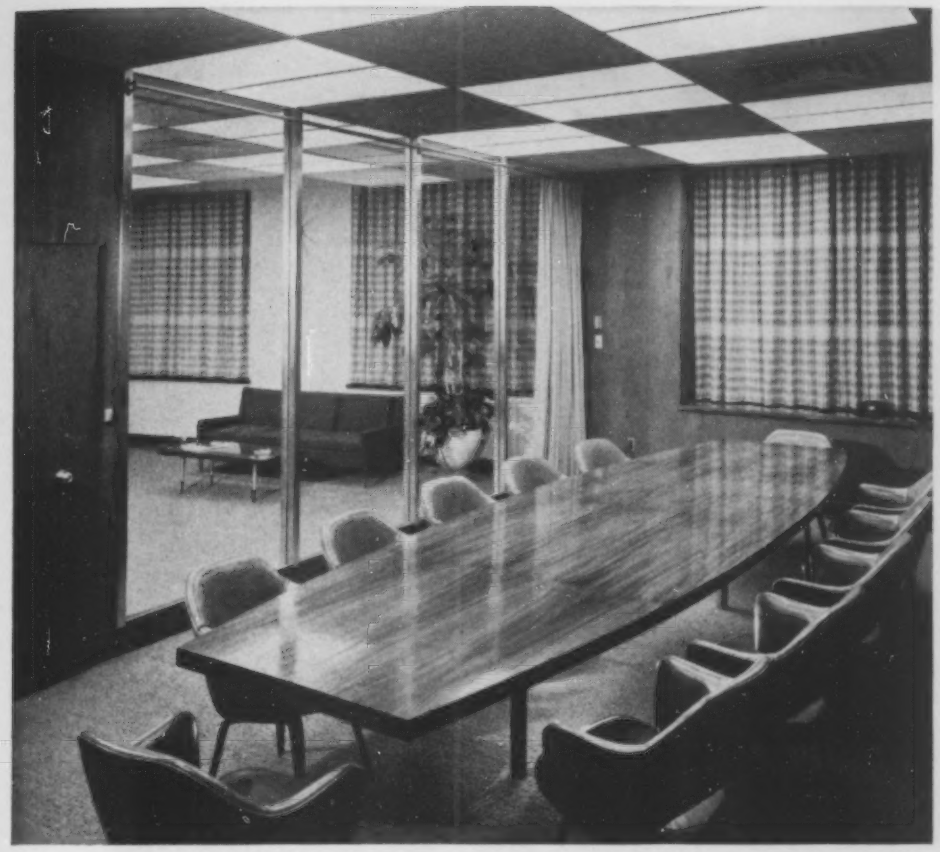

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# People

## U.S. industrialist to donate art academy to Berlin; Washington planners criticized

CLIFFORD GREY

REICHHOLD

U.S. Industrialist **Henry H. Reichhold**, president of Detroit's Reichhold Chemicals, Inc. (synthetic resins), has contributed heavily to the Detroit Symphony, and is himself an ardent amateur violinist. He is also a native of Berlin, who hopes that some day that city will again attain its former eminence as a leading center of art and culture. To further this hope, Reichhold recently announced his plans to build a $1 million academy of arts in the Hansa quarter of West Berlin. The West Berlin Senate has approved the site and Reichhold has picked an old friend, **Werner Duettmann**, who was an associated architect with U.S. Architect **Hugh Stubbins** on the Berlin Congress Hall (FORUM, January 1958), to design the building. Architect **Sabine Schuman** of Hamburg will be associated with Deuttmann in the project. The new building will provide an exhibition hall and theater, as well as living quarters for visiting artists.

---

### *CAPITAL PLANNERS UNDER FIRE*

JUSTEMENT

A group of prominent architects recently blasted Washington planners—and particularly the National Capital Planning Commission, the federal agency which oversees all planning in Washington—charging that planning in the capital has "degenerated into mere obstructionism." Leading the attack on the planners was Washington Architect **Louis Justement**, chairman of the American Institute of Architects' National Capitol Committee. As chairman of the Capitol Committee Justement has been in numerous squabbles, most recently one that raged over the East Front extension of the U.S. Capitol and the controversial proposal to bridge the Potomac at the foot of Constitution Avenue (FORUM, April 1958). Justement's experiences in these battles prompted the blast against the planners, who, he charges, "merely incite arguments and delays" in their advisory capacity on many District problems. On urban renewal, Justement charges that the National Capital Planning Commission has full power to make decisions, not just advise. Yet it wastes time on "trivial details instead of the creation and realization of a powerful and imaginative city plan." Justement recommends that an organization be set up to "plan, finance, and construct" all the needed projects for the whole metropolitan Washington area, and that as a beginning, an agency to plan and administer mass transit be established. Other architects who joined with Justement in the proposals were **Eero Saarinen**, **John F. Harbeson**, **Henry R. Shepley**, and **Edward D. Stone**, all members of the AIA's National Capitol Committee.

---

### *NEW CAPITAL PLANNER*

In the wake of the charges by an AIA committee that planning in Washington, D.C. is "mere obstructionism" (see above), the National Capital Planning Commission announced the appointment of a new executive director. **William E. Finley**, 34, recently a lecturer on planning at the University of Pennsylvania, was appointed to succeed **John Nolen Jr.** While the commission denied that the AIA charges spurred the change, other District planners believe that they may have been a contributing cause. Officially, the commission's executive committee, headed by Planner **Harland Bartholomew** (FORUM, February 1958), said a new executive director was hired "in the interest of a more effective administration of the work of this commission, and also in the interest of a much-needed improvement of public relations."

FINLEY

Finley is a graduate of the University of California, and former planning director of Richmond, California. He was also responsible for planning the expansion of the town of Ravenswood, West Virginia, where Kaiser Aluminum & Chemical Corp. has a large aluminum refining plant.

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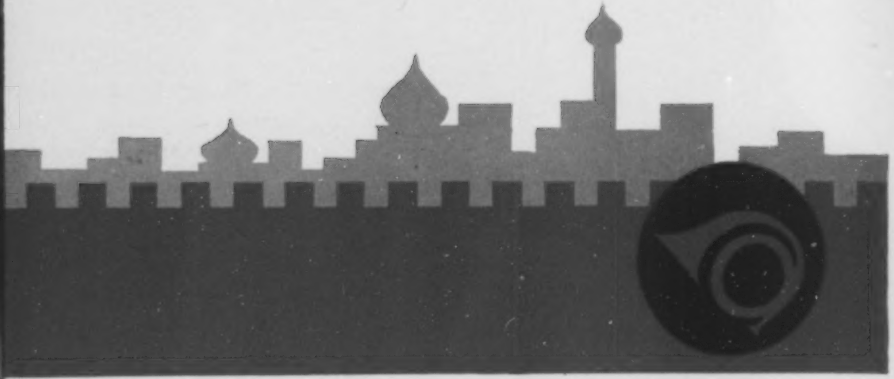
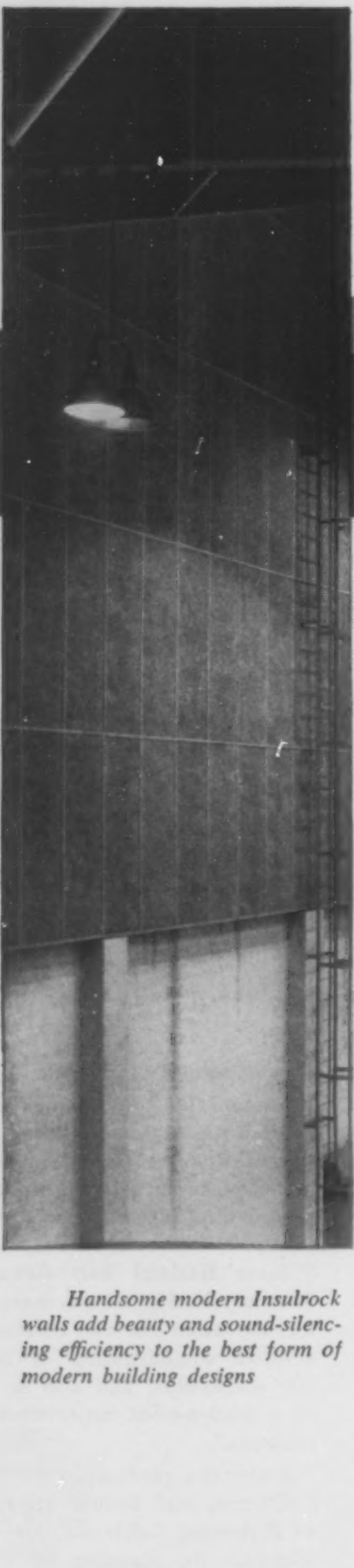
### *NO OSCAR FOR WRIGHT*

**Frank Lloyd Wright**, who made his debut on network television some months ago as a subject of a lengthy TV interview, had a chance to become a movie actor recently,

*continued on page 81*





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and passed it up. According to LIFE magazine, Movie Producer **David O. Selznick**, in the course of making the picture, *A Farewell to Arms,* was looking for someone to play the small part of Count Greffi, a well-preserved 90-year-old Italian count equally skillful at world-weary philosophy as he is at billiards. Selznick shuffled through a group of actors, including Alfred Lunt, Noel Coward, and John Gielgud, then turned to three well-known gray-beards (or white-hairs): Leopold Stokowski, Bertrand Russell, and Wright. Wright was flabbergasted when Selznick phoned him, asking him to take the part, first on the grounds that it would be good for the movie industry, second "as a lark." Wright was amused by the idea, but would not consider it and told Selznick so despite repeated urgings. Finally, Selznick, unable to cast the part at all, dropped the idea of using the Greffi scene in the picture.

### *FELT CLEANS UP*

A full-fledged scandal has broken out in New York City's Bureau of Real Estate. The Bureau, which manages over $4 million worth of city properties, has been frantically cleaning house ever since evidence was uncovered two months ago that funds had been misappropriated by employees, that exorbitant rents had been paid on some properties rented by the city, and that contracts to outside firms for relocation of tenants from sites the city wanted cleared sometimes resulted in kickbacks to bureau employees. A few weeks ago, Mayor **Robert Wagner** appointed **James B. Felt**, well-known realtor and chairman of the City Planning Commission, to head the bureau until all irregularities are straightened out. Felt will replace **Percy Gale Jr.**, who has headed the bureau for the past four years.

FELT

Felt, who continues as chairman of the Planning Commission, has moved quickly. He has suspended contracts with some real estate management firms because, he said, tardiness of filing their official reports of services rendered might indicate "questionable business practices." He has also ended the practice of selling city property in so-called over-the-counter sales—in which announcements are buried in a few official circulars—in favor of publicly announced public bidding.

### *WINSTON ABROAD*

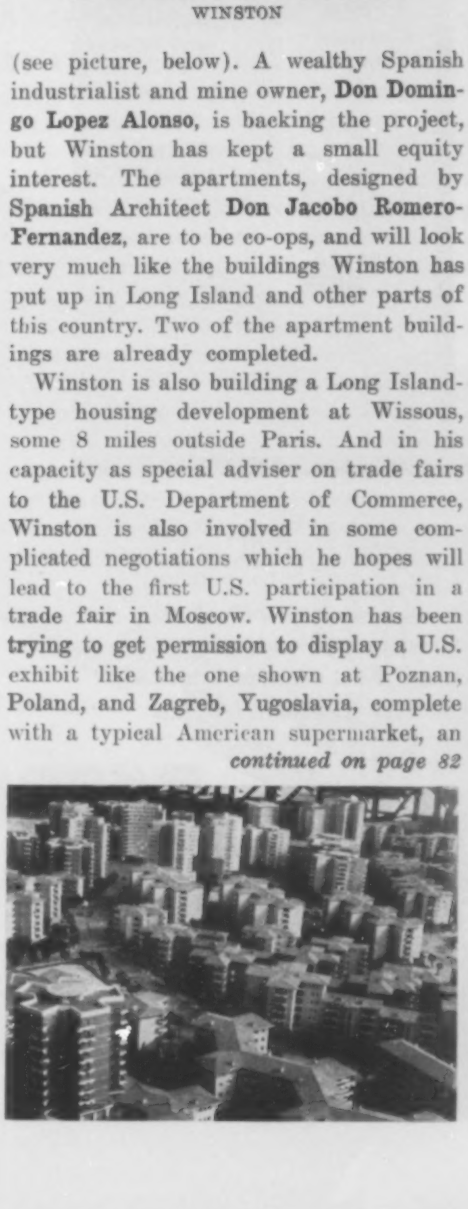
After building more than a quarter of a billion dollars worth of housing in the U.S., New York Builder **Norman Winston** has lately been turning his attention overseas. Winston recently announced that he was building a $45 million development near a new steel plant in Aviles, in northwest Spain. Although most of the project is housing (5,500 units) for about 18,000 steelworkers and their families, Winston is also building an American-style supermarket, movie theater, schools and churches (see picture, below). A wealthy Spanish industrialist and mine owner, **Don Domingo Lopez Alonso**, is backing the project, but Winston has kept a small equity interest. The apartments, designed by Spanish Architect **Don Jacobo Romero-Fernandez**, are to be co-ops, and will look very much like the buildings Winston has put up in Long Island and other parts of this country. Two of the apartment buildings are already completed.

KARSH, OTTAWA

WINSTON

Winston is also building a Long Island-type housing development at Wissous, some 8 miles outside Paris. And in his capacity as special adviser on trade fairs to the U.S. Department of Commerce, Winston is also involved in some complicated negotiations which he hopes will lead to the first U.S. participation in a trade fair in Moscow. Winston has been trying to get permission to display a U.S. exhibit like the one shown at Poznan, Poland, and Zagreb, Yugoslavia, complete with a typical American supermarket, an

*continued on page 82*



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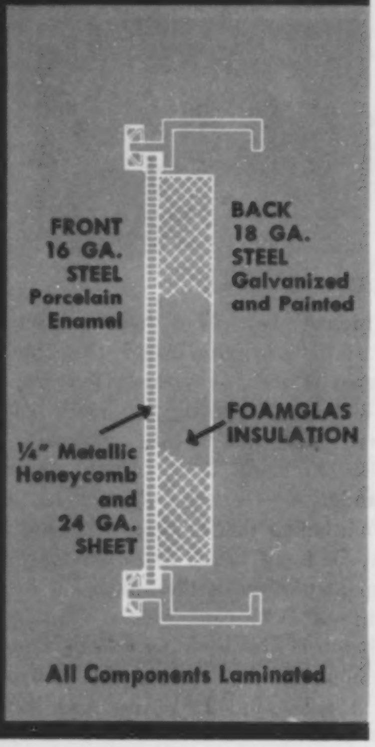
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aluminum house, movies, and a fashion show. The Russians have agreed to the exhibit, but have insisted that it be ready by September when the fair is slated to open. Winston doubts that the American exhibits can be ready by then.

### *TRIBUTE TO OLD BLUES*

Three prominent members of the faculty of Yale University's School of Architecture & Design were honored by alumni and fellow faculty members a few weeks ago.

ALBERTUS—YALE NEWS BUREAU

PFISTERER, SMITH, ALBERS

Honored at a special dinner were: **Henry A. Pfisterer**, professor of architectural engineering, **Boyd M. Smith**, professor emeritus of drama and recently retired dean of the school, and **Josef Albers**, artist, who will retire as Chairman of the Department of Design on June 30. For the occasion, Yale design instructor **Robert Engman** concocted the sculptures shown above. Each faculty member was presented with a small silver sculpture, supposed to "reflect the personality and interests of the recipient."

### *RECENT AWARDS*

The Architectural League of New York recently awarded a silver medal to **Skidmore, Owings & Merrill** for their Connecticut General Life Insurance building near Hartford, Connecticut and honorable mentions to **Hugh Stubbins & Associates** of Cambridge, Massachusetts for the design of the Berlin Congress Hall and to **Anshen & Allen**, San Francisco, for their Chapel of the Holy Cross in Arizona. . . . Sculptor **Jean de Marco** won the League's gold medal for sculpture, and also won a $1,000 prize award of the American Academy of Arts & Letters. . . The League's Arnold W. Brunner scholarship award for 1958 went to New York Architect **Paul Damaz**, who will use the $2,500 prize money to make a slide-film presentation titled "The Integration of the Arts in Latin American Architecture." END

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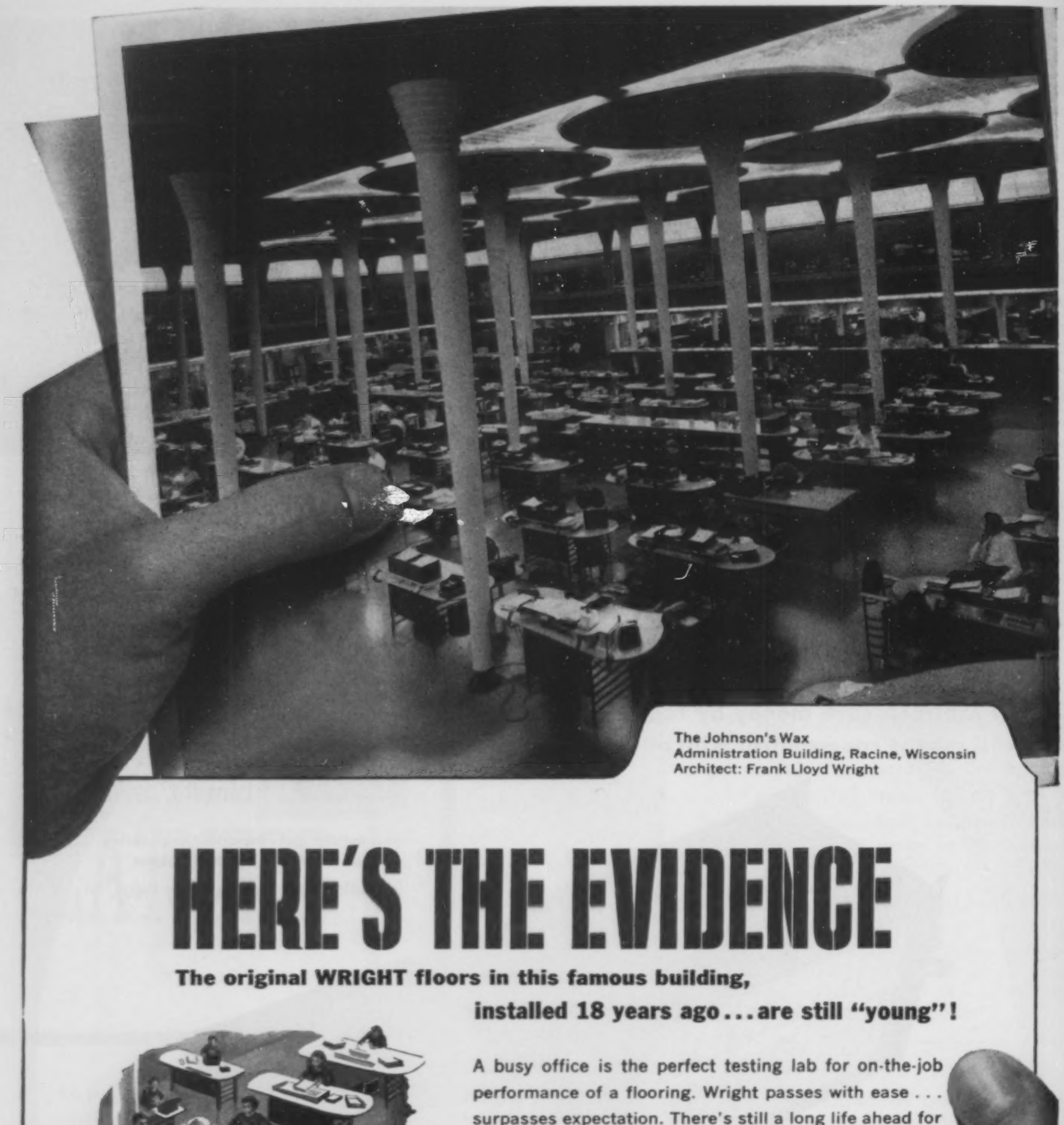

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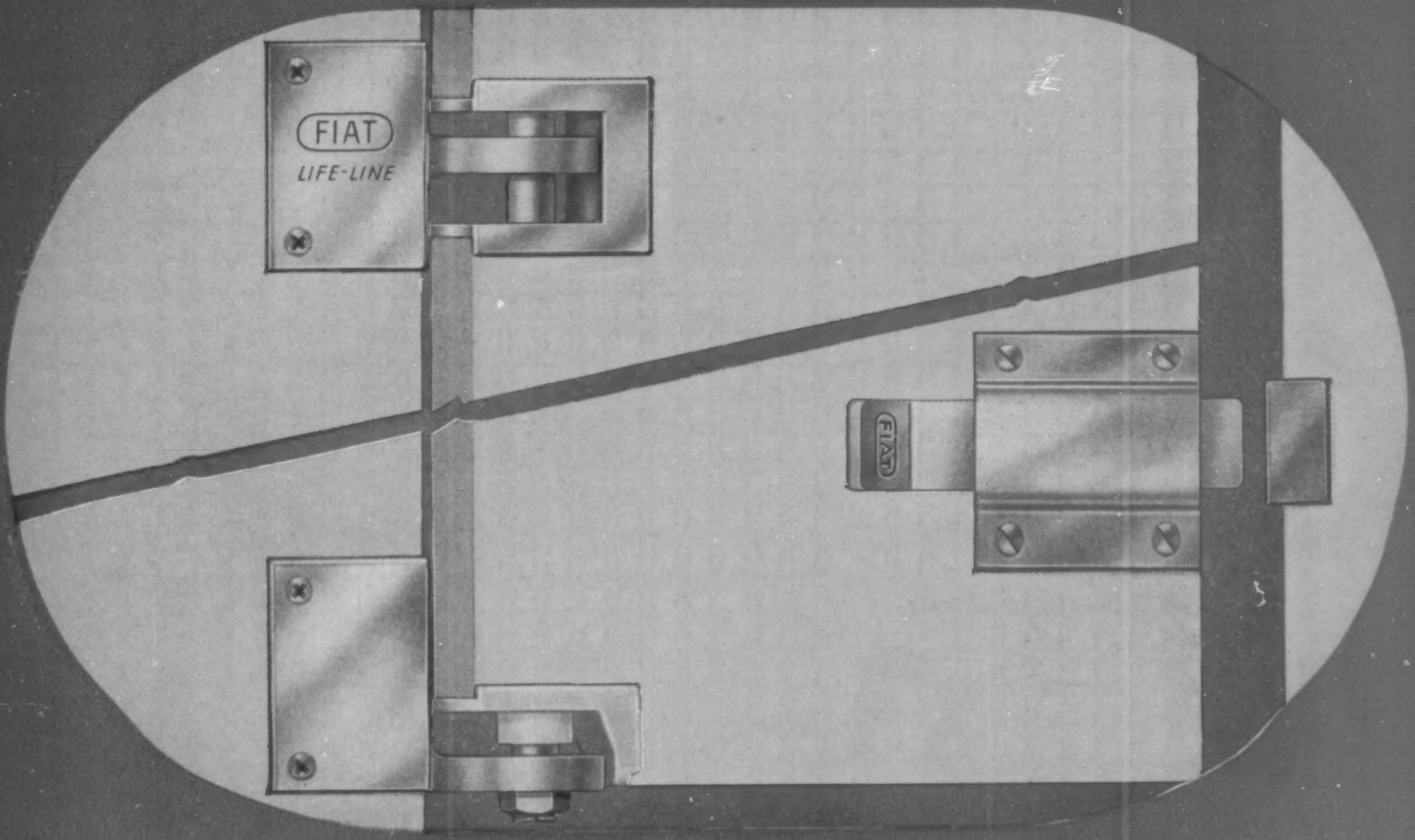

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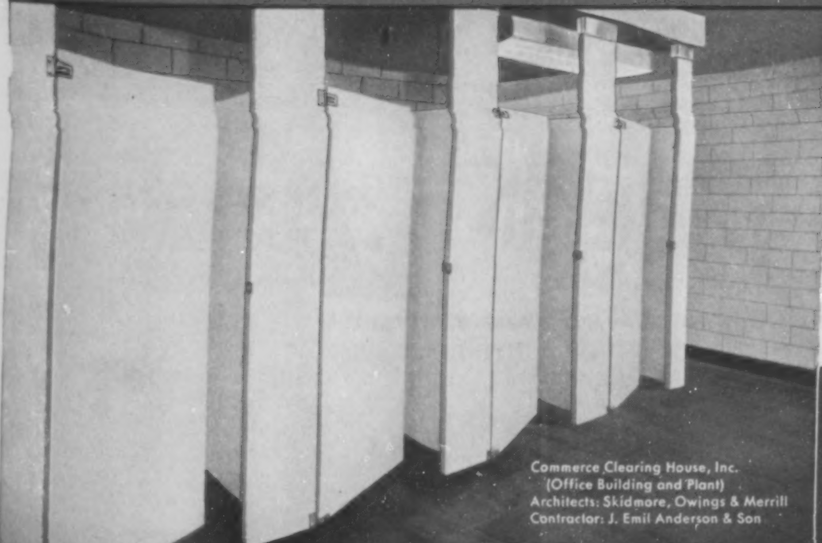

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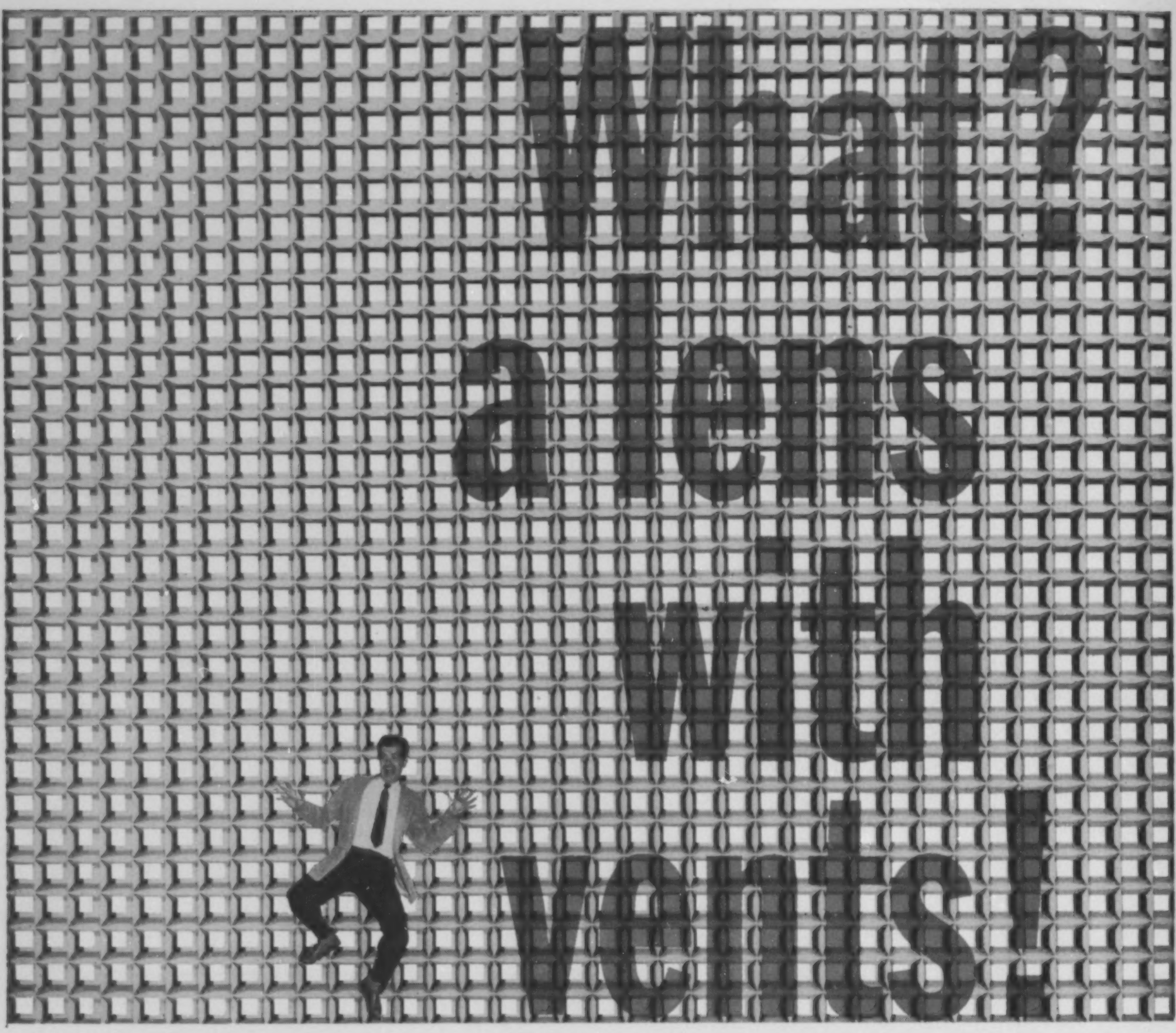

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## Editorial

# Architecture and competition

There have been too few architectural competitions in the U.S. in recent years. Indeed, not since Eero Saarinen won the Jefferson Memorial contest back in 1948 has there been a major open competition for an important building.

This is unfortunate, for it has deprived the U.S. of many bright new ideas that have remained locked in the heads of bright young architects, many of whom cannot qualify before building committees because they have never designed a hospital or city hall before, or because they do not have a big enough organization to handle a major job.

The absence of competitions is unfortunate for clients, too. For clients would, in many cases, get better buildings at very little (if any) extra cost if they organized the right kind of competitions.

Why are architectural competitions, which are so popular in Europe and Latin America, so rare in the U.S.? Why does the U.S. not give its young architects the same opportunity and encouragement that their fellow professionals get in other countries? One reason, perhaps, is that few clients in the U.S. seem to know very much about competitions and how they should be organized to safeguard both the architects' and the clients' best interests. (One easy way to find out: write to the A.I.A., 1735 New York Avenue, N.W., Washington 6, D.C.) Another reason is that the immediate postwar building boom kept most firms so busy that competitions rarely attracted top talent. But now that activity in many architects' offices is slowing down a bit, it seems much more likely that bigger firms would be willing to enter competitions rather than leave the field entirely to beginners.

Last month, an exemplary architectural competition closed at Toronto, Canada. The objective was to select an architect for Toronto's proposed City Hall and Square, and the competition was so well set up that a great deal can be learned from it.

To start with, Toronto was an open competition *in two stages*. This is important, because many architectural offices with big overhead costs cannot afford to enter one-stage competitions. But in a two-stage competition the entries for the first stage can be simple and inexpensive—just detailed enough to convey an idea. If the idea is accepted, the competitor is asked to go on. At Toronto, eight competitors will be admitted to stage two, and each will be paid $7,500 for his additional work.

For the city of Toronto the cost of the competition will be surprisingly low. Toronto expects to spend no more than $85,000—i.e., less than ½ of 1 per cent of the $20 million building budget—on the contest. And $60,000 of that amount will go to the eight competitors selected to enter Stage Two. The remaining $25,000 will pay for jury fees, for a professional adviser and for printing, mailing, and miscellaneous expenses.

In return, Toronto will get about 1,000 architectural ideas worth perhaps $3 million, and the advice of one of the best architectural juries ever assembled, including such men as Architects Eero Saarinen (U.S.) and Ernesto Rogers (Italy). The architect selected by this discriminating jury will get the commission to build the City Hall—and his prize will be a $25,000 advance against that commission.

Such competitions would obviously be good deals for many municipal, state, and federal clients in the U.S. —providing they were not in too much of a hurry. For a competition does take time—about three months are required for planning, three months to prepare the drawings, another month to judge the entries. However, part of the time spent on planning (i.e., writing the program) would have to be spent under a direct architect-selection system as well, and the time spent by competitors in preparing their entries is not wasted either—it brings the winning competitor that much closer to a final scheme acceptable to the client.

Needless to say, competitions would be a very good thing for young architects, too. Some of the brightest names in U.S. architecture —men like Richardson, the two Saarinens, Henry Hornbostel, and others—got a big and early start toward their present eminence by winning a competition.

More private clients in the U.S. might do well to try an occasional competition on the quick, sketchy European basis, perhaps demanding evidence of responsibility and performance from the competitors, or reserving the right to demand that the winner associate with a well-known firm in executing the project.

But public clients are the ones for whom competitions are most appropriate. Local, state, and federal governments generally require competitive bidding among contractors as a matter of law. Architects, as professionals, cannot compete on the basis of fees, of course, but they can and should compete on the basis of ability.

## Democracy and Apollo

The seventy-fifth birthday, this month, of Walter Gropius, the master architect and master teacher, is a reminder that the pioneers of modern architecture are growing older. "Grope," almost alone among these pioneers, has dedicated himself to encouraging independent development in a younger generation, and is accordingly beloved.

He grew up in a time now distant, when machinery and industrialism were dirty words among artists, and his finest work was in helping art and industry to turn around and serve one another. Now that modern architecture has progressed beyond this initial phase, it is easy for successors to impute to Gropius and his colleagues an excessive involvement in "mechanization." But he himself recently demonstrated the far greater depth of his concern about life when he was awarded the Goethe prize last year at the University of Hamburg.

"When I speak of democracy," Gropius declared in his response, "I am talking about the way of life which is slowly spreading over the world." The masses now undertake decisions once confined to an "elite," he went on to say, and they create great problems for the artist through their lack of preparation. "Although man is born with eyes he learns to see only by a slow process," which drags in a bookish age. "Sensual perception has remained undeveloped and with it the interest in what is beautiful." Lacking not only visual training but that sense of wholeness, of symbolism, and poetic meaning, which the arts gave in a more settled society, this age yielded itself to mechanization; "the tools of civilization became too much for us," and people took refuge in sharply limited tasks, "refusing to feel responsible for anything outside." Gropius might have added that the public also escaped responsibility in sybaritic pleasures.

In such a situation, the Apollonian assignment of the artist, according to Gropius, is to use his intuitive abilities and his independence to create an "antidote to overmechanization" by finding a symbolic expression recognizable to all for the experiences of an industrial age.

Consequently, far from promulgating the doctrine that only machinelike forms were "modern," and automatically so, Gropius and his group sought for that common visual training and common understanding and joint effort that would let all modern artifacts, "from teacup to city," be lifted into expressiveness. "Beauty is an essential part of life," he declared, "and cannot be isolated as a special privilege of the esthetically initiated; it belongs to all mankind." That is still a noble aim.

END

# Frank Lloyd Wright designs for Baghdad

When Frank Lloyd Wright flew to Baghdad last May to design a Grand Opera and Civic Auditorium, he was, in a sense, coming to familiar ground; for he has known and loved from boyhood the tales of the "Arabian Nights." These classic tales celebrate the glorious days of Baghdad during the eighth-century rule of Caliph Haroun Al-Rashid. The results of the trip, shown here, reach far beyond a mere auditorium, for they would celebrate the glorious days of a modern Baghdad.

The alluvial plain of the Tigris and Euphrates on which the city is built has a history of civilization older than Egypt or Palestine. On this plain, legend has it, once stood the Garden of Eden. Here too were the ancient cities of Sumeria, Isin, Larsa, and Babylon, where, perhaps, architecture began.

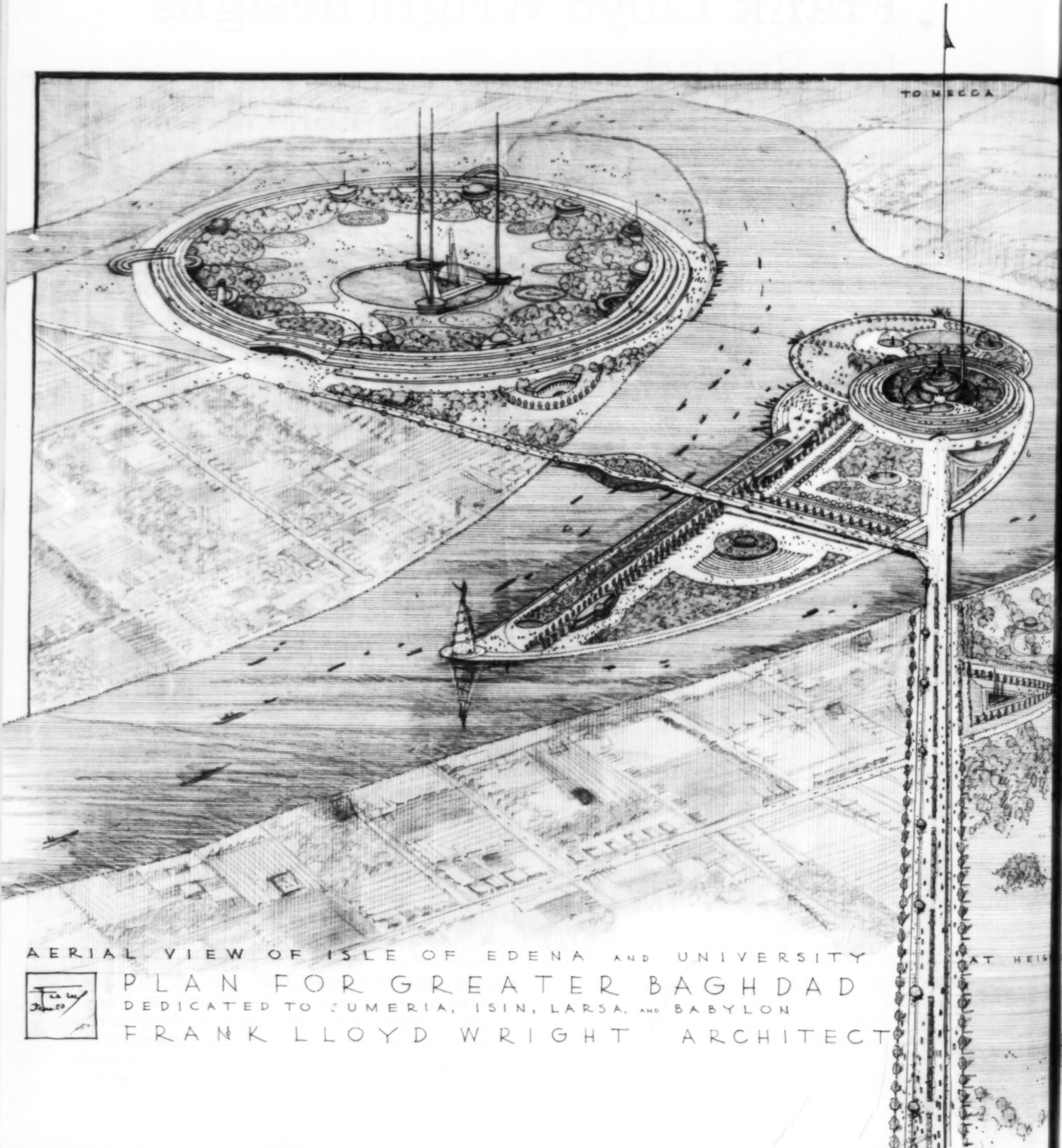
The Development Board of Iraq, which called Wright to Baghdad, has at its disposal 70 per cent of the country's enormous oil revenues (equal to $1.4 billion in a six-year program). Already, the Board's completed projects of irrigation and flood control are causing the flat desert plain to bloom again, as it did in the days of the hanging gardens and ziggurat towers of legendary Babylon.

Last year, with the river safely contained behind great new dams and with large-scale educational projects, housing, and irrigation work well underway, the Development Board could turn its attention to public buildings. For Frank Lloyd Wright, here was a chance to demonstrate what he had tried to teach in Japan and to preach in the U.S.—that a great culture deserves not only an architecture of its time, but of its own.

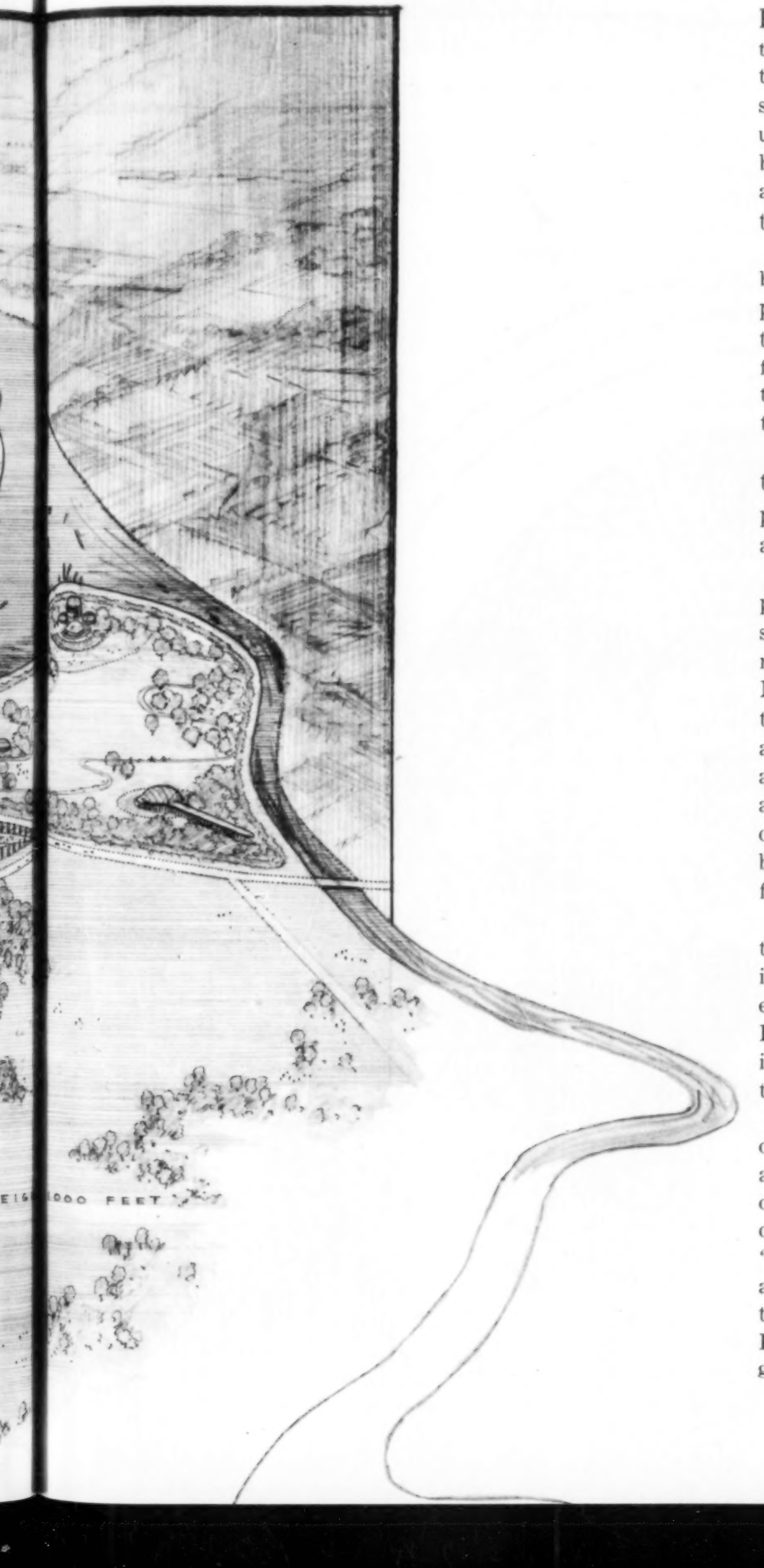
The island in the Tigris he selected for his demonstration was owned by King Feisal II and had remained undeveloped because of the floods which periodically inundated it until flood control dams were completed upstream in 1954. For this site he sketched not only an opera auditorium, but a cultural center befitting a great city of one million people (twice as many as ten years ago). From the island he projected a great esplanade into the old city center, while across the Tigris, on the site reserved for the University of Baghdad, he suggested that a circular, ziggurat-surrounded campus be built—and, though not commissioned to work on the University, Wright submitted a basic development plan.

On the following pages are the sketches of Wright's imaginative proposals for the Opera and the University as well as the preliminary plans for a new Baghdad Post and Telegraph Building (which is a second commission from the Development Board). The text is excerpted from Wright's own submission to the Board.

Plan of the Cultural Center for Greater Baghdad...Opera Auditorium on Isle of Edena...


TO MECCA
AERIAL VIEW OF ISLE OF EDENA AND UNIVERSITY
AT HEIG 1000
PLAN FOR GREATER BAGHDAD
DEDICATED TO SUMERIA, ISIN, LARSA, AND BABYLON
FRANK LLOYD WRIGHT ARCHITECT

University of Baghdad across the Tigris . . . earth-mound ziggurats used for parking.



FLLW: These designs demonstrate that if we are able to understand and interpret our ancestors, there is no need to copy them. Nor need Baghdad adopt the materialistic structures called "modern" now barging in from the West upon the East. The designs shown here revive the natural beauty of form, the ancient crafts of ceramics and metal, and the use of the ground that produced the architecture of the Middle East.

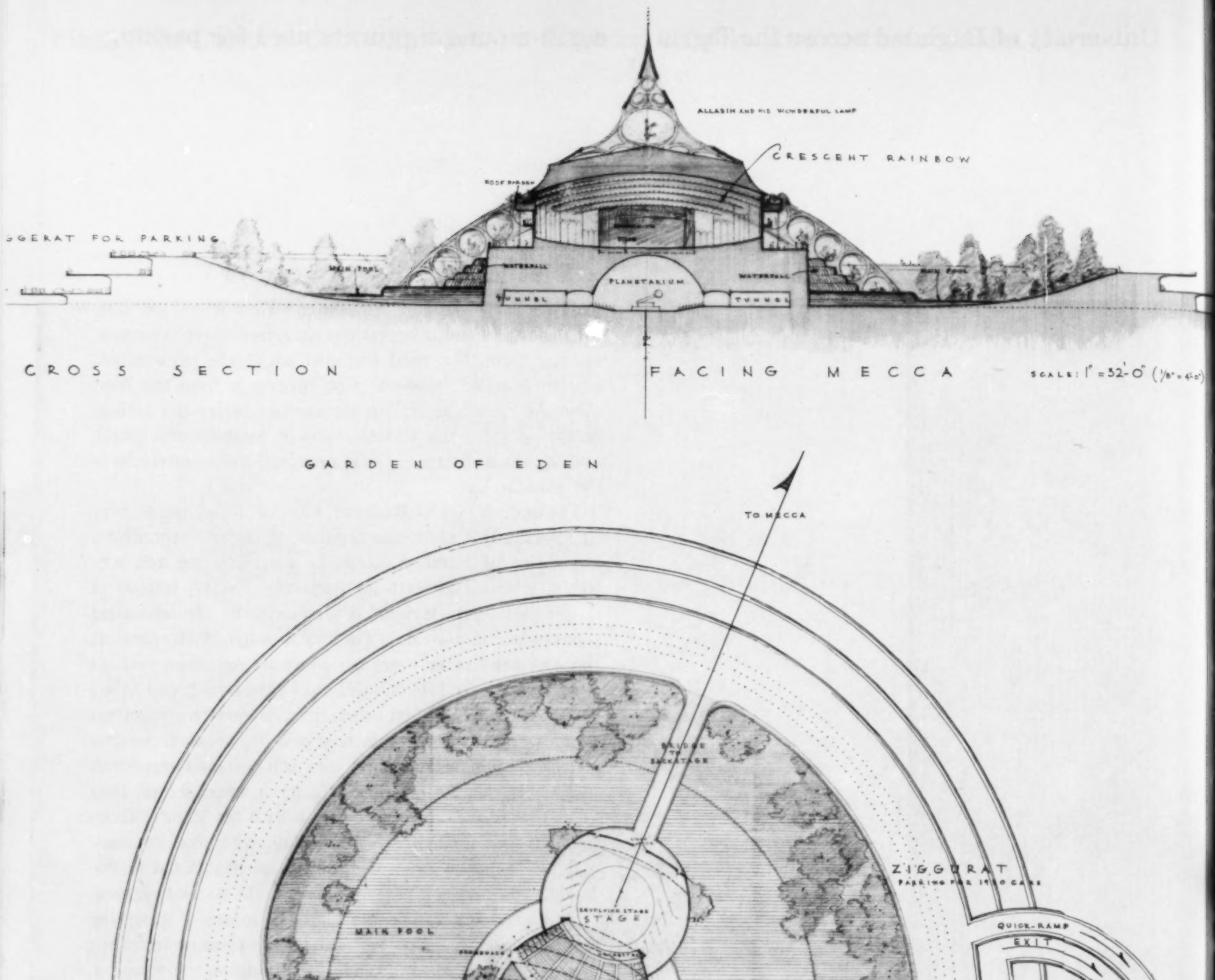
The original city of Baghdad, built in the eighth century by Haroun Al-Rashid, was circular in plan and contained a population of 2 million people in a surrounding and protecting ziggurat of earth and masonry. Today, instead of flood or invasion, Baghdad is threatened by the increasing thousands of motor cars. (The city now has 30,000 cars, six times as many as ten years ago. Most are American makes.)

Thus, Baghdad is in danger, and I have here hoped to see the Middle East put first things first. As modern civilization proceeds and advances, this most pressing problem requires a basic solution or the modern city will become impractical.

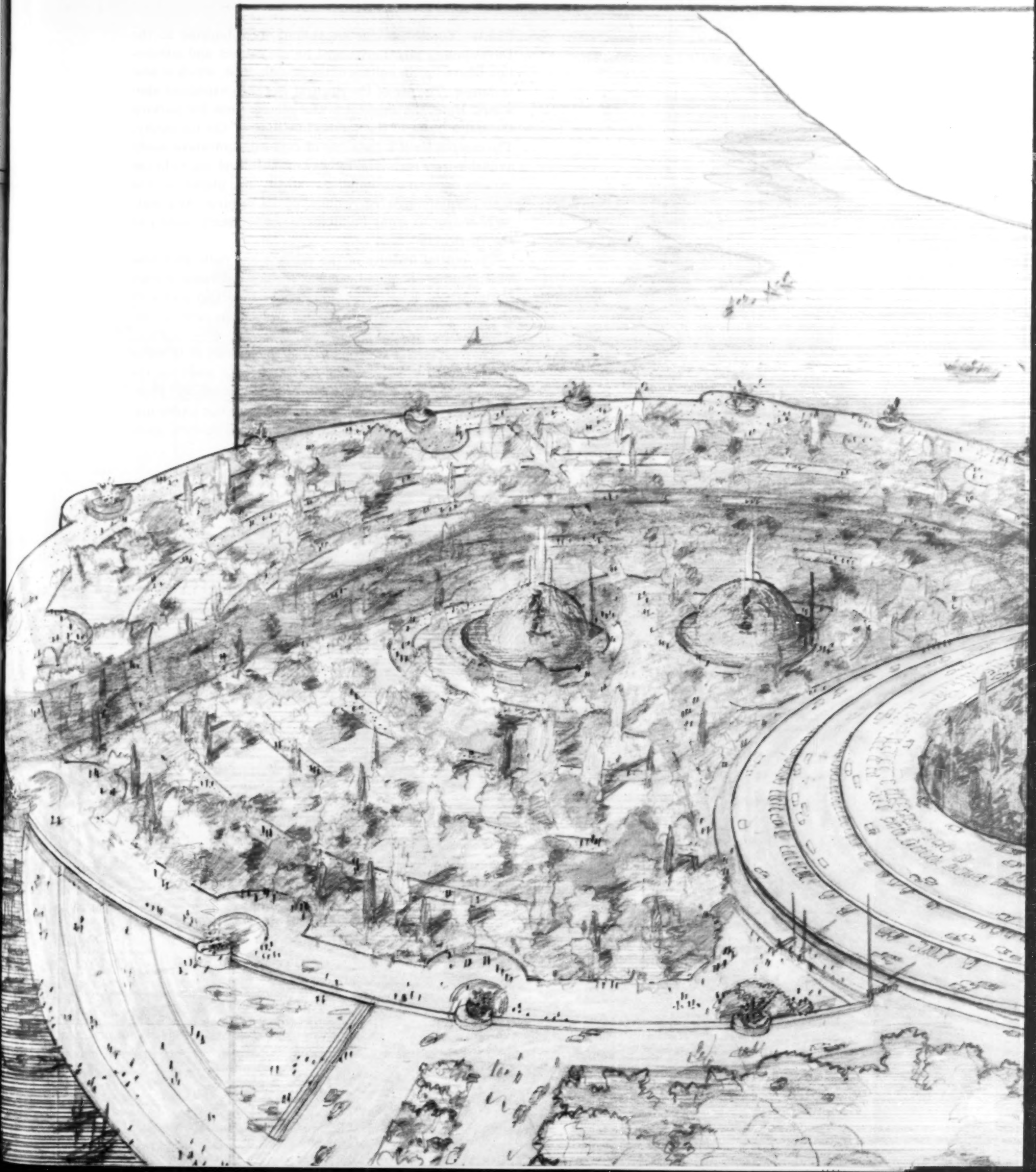
When the ancients wanted dignity in architecture, they piled upward great mounds of earth with the labor of thousands of men for many years. Today, with modern road-making machinery, we accomplish as much in a few weeks. Modern machinery is here used to raise the ancient ziggurat to a new use as a plastic and plausible means of absorbing and harboring the motor car. Safety and pleasure in transit are thus accomplished instead of the dangers, the vexation, and the growing frustration of crisscross on the ground with one-level approach to buildings. Thus, fine buildings may be built with spirit and enjoyed without seeing them flooded by acres of antipathetic motor cars.

The drawings show ziggurats of three levels surrounding the Opera Auditorium and the University Campus. Initially, these ziggurats could be reduced to two levels or even one, with additional levels added as traffic increased. Earth fill can be obtained from cutting down the size of the island and (in the case of the University) by grading on the site.

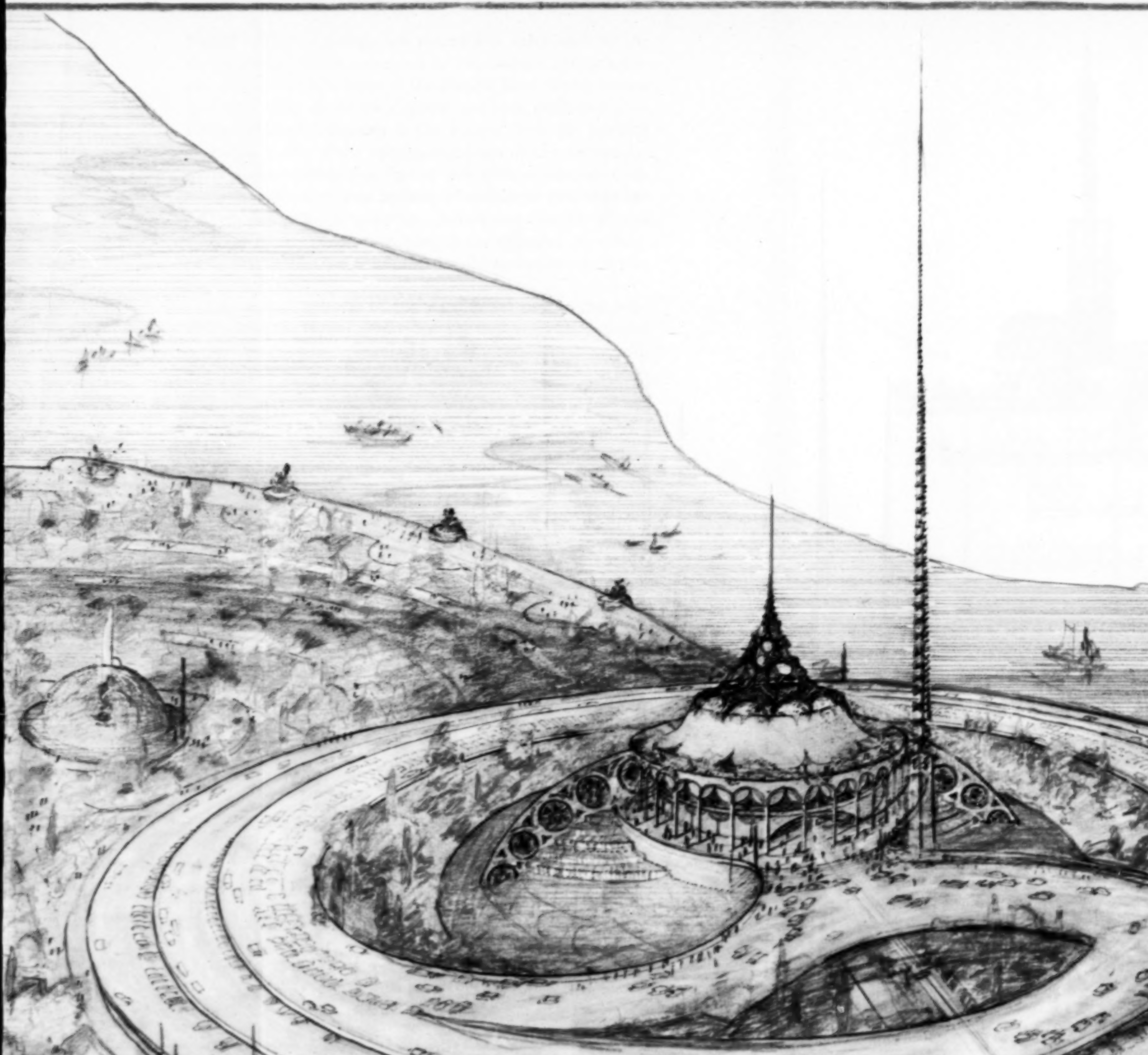
The Grand Opera and Civic Auditorium is at the head of a great esplanade oriented toward Mecca. A second avenue crosses the Tigris to link the great arch entrance of the University campus with the esplanade. At the head of the island itself, behind the Opera Auditorium, is a "Garden of Eden," with two fountains symbolizing Adam and Eve. From the garden another avenue reaches toward the base of the island, where a 300-foot-high statue of Haroun Al-Rashid has been placed. On the way, an art gallery and museum are located.

ALLADIN AND HIS WONDERFUL LAMP
CRESCENT RAINBOW
ROOF GARDEN
GGERAT FOR PARKING
MAIN POOL
WATERFALL
PLANETARIUM
WATERFALL
MAIN POOL
TUNNEL
TUNNEL
CROSS SECTION
FACING MECCA
SCALE: 1" = 32'-0" (1/8" = 4'-0")
GARDEN OF EDEN
TO MECCA
BRIDGE TO BACKSTAGE
ZIGGURAT
PARKING FOR 1950 CARS
REVOLVING STAGE
STAGE
MAIN POOL
QUICK-RAMP
EXIT
MAIN POOL BELOW
WATERFALL
UPPER POOL
ENTRANCE FOYER
CRESCENT RAINBOW
ENTRANCE TO AUDITORIUM
UPPER POOL
STAIR UP FROM PARKING LEVEL
SWORD OF MOHAMMET
CASCADE
STAIR OF ZIGGURAT
COURT
OPEN DOWN TO GROUND LEVEL
ZIGGURAT
PARKING FOR 1950 CARS
TIGRIS
0 50 100 150 200'
SCALE: 1" = 32'-0" (1/8" = 4'-0")
PLAN AT TOP OF ZIGGURAT AND ENTRANCE TO AUDITORIUM
OPERA HOUSE
PLAN FOR GREATER BAGHDAD
FRANK LLOYD WRIGHT ARCHITECT

Grand Opera and Civic Auditorium . . . set in natural water gardens surrounded by a motor ziggurat . . . t



ns surrounded by a motor ziggurat . . . the proscenium curves over the audience and sweeps out on eith



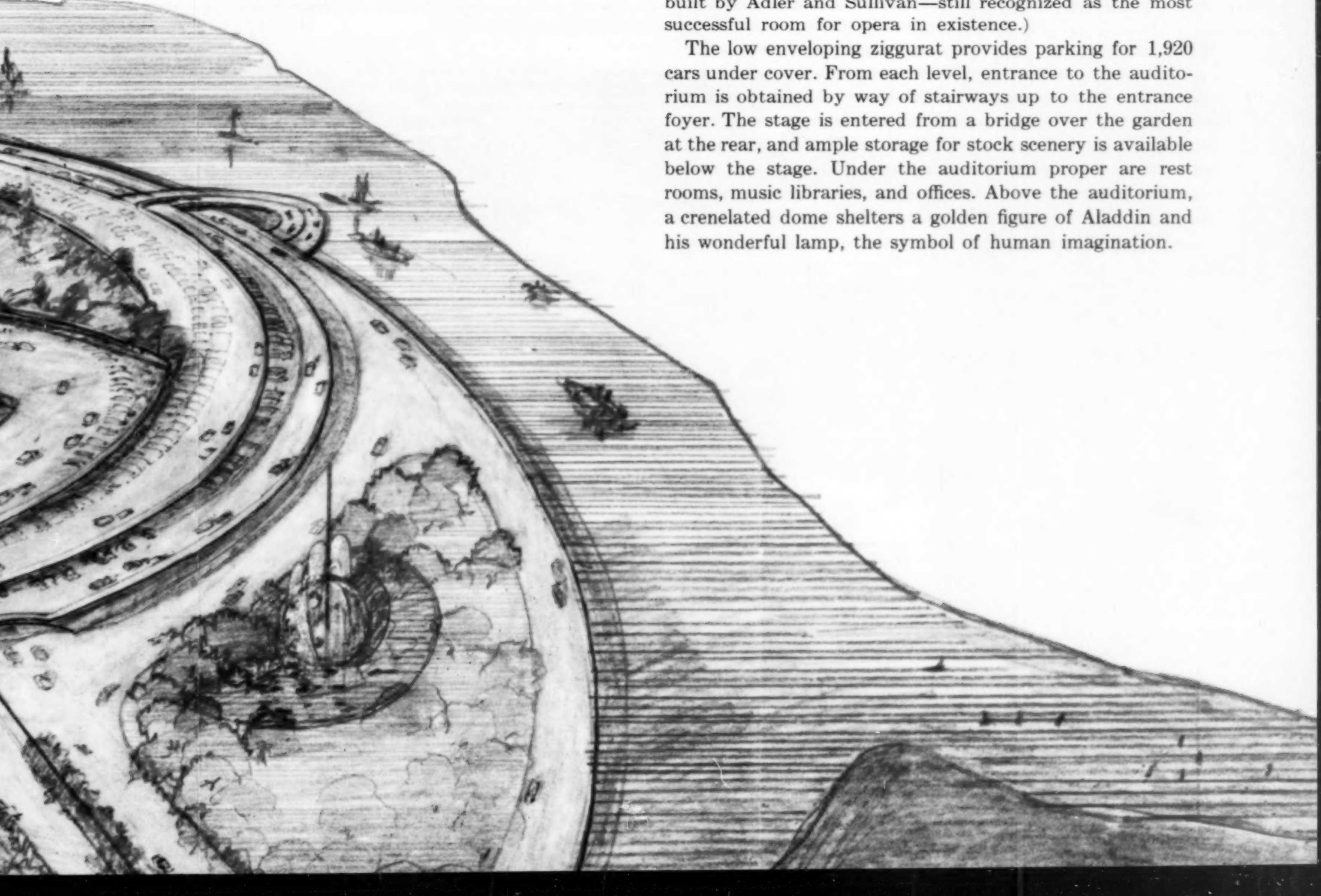
**on either side of the building as a crescent arch decorated with scenes from the *Arabian Nights*.**

FLLW: The Grand Opera and Civic Auditorium for Greater Baghdad should be a beautiful expression of historic nature and therefore as inspiring to the culture of Iraq as any religious edifice ever was. But the specific form is of no previous known pattern.

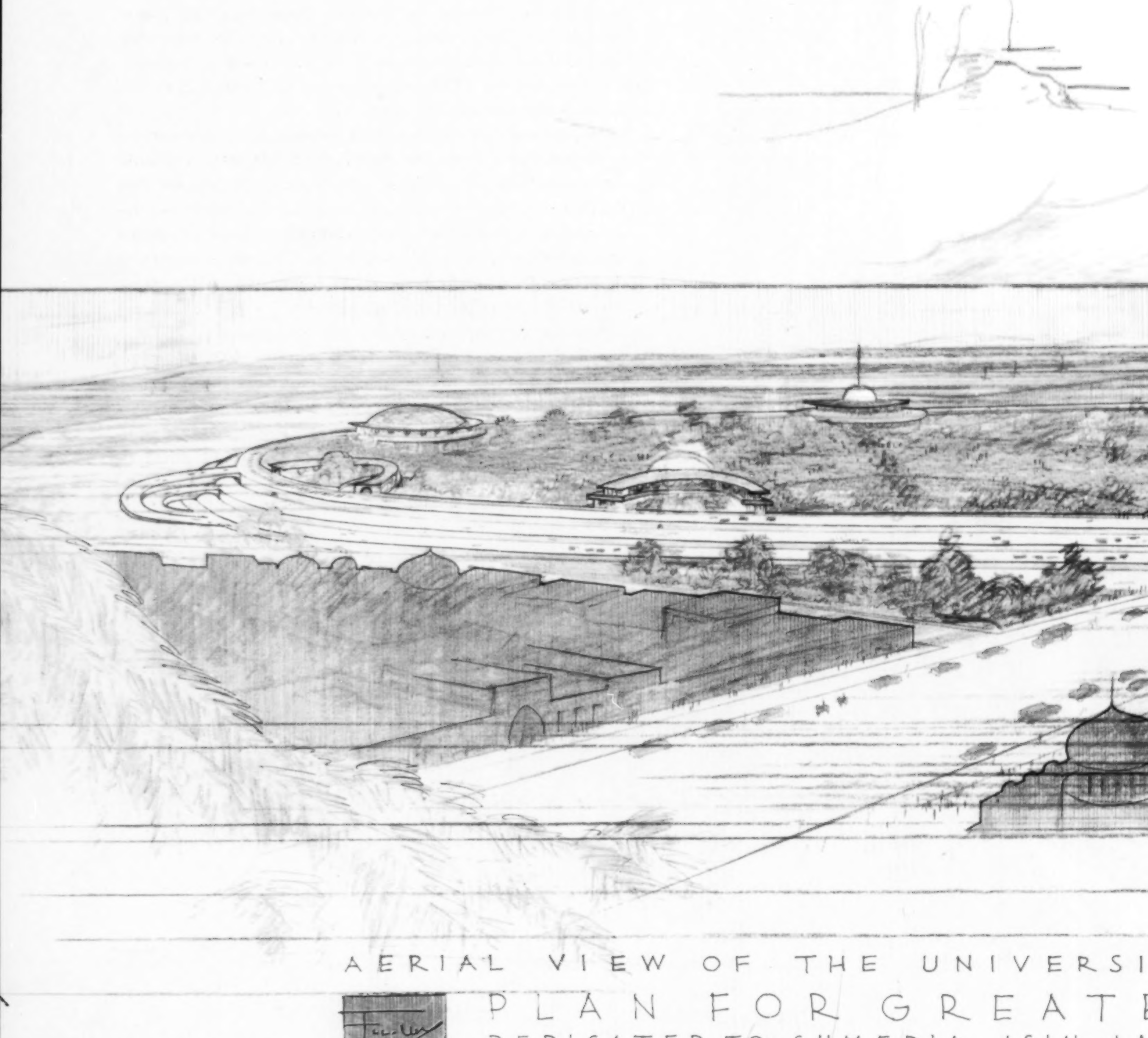
From the focal point of the proscenium at the stage, the auditorium ceiling curves upward and out, carrying sound as would the hand cupped above the mouth. This curved ceiling and the crenelated dome above is carried not only on the walls of the auditorium but by the bracing walls of the stagehouse and the great crescent arch which shows outside. Each wing of the arch descends behind a series of fountain-waterfalls to the gardens. These wings, as poetic extensions of the acoustic principle involved, are decorated with metal-sculptured scenes from the classic "Thousand and One Nights." This sculpture can be viewed from the promenades around the opera hall.

The crescent arch allows the 1,600-seat opera auditorium to be separated from the additional 3,700 seats available for conventions or patriotic celebrations. To achieve this flexibility, sliding screens are hung to the curve of the crescent as it shows itself inside. (Similar acoustic principles and flexible seating were used in the Chicago Auditorium built by Adler and Sullivan—still recognized as the most successful room for opera in existence.)

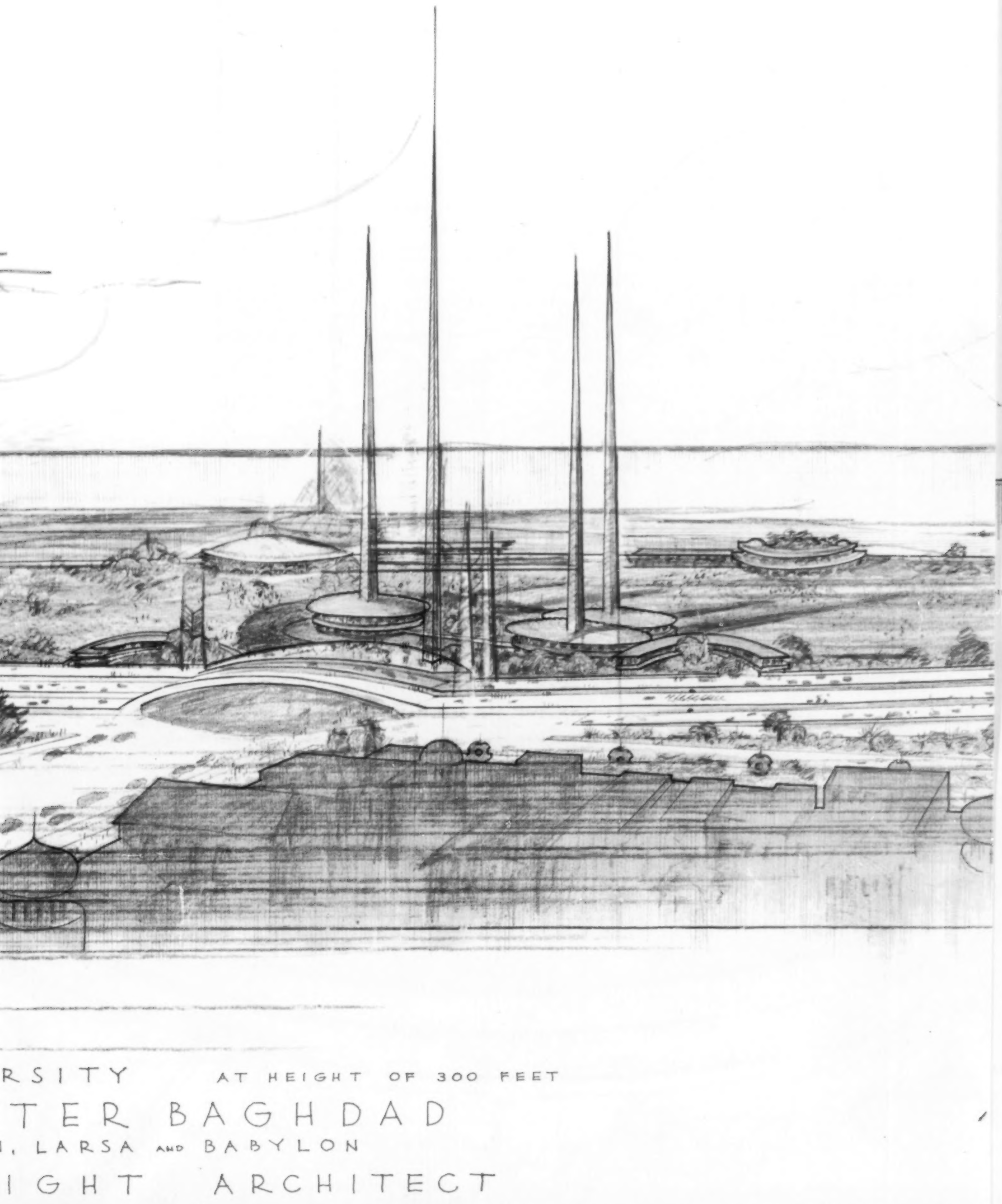
The low enveloping ziggurat provides parking for 1,920 cars under cover. From each level, entrance to the auditorium is obtained by way of stairways up to the entrance foyer. The stage is entered from a bridge over the garden at the rear, and ample storage for stock scenery is available below the stage. Under the auditorium proper are rest rooms, music libraries, and offices. Above the auditorium, a crenelated dome shelters a golden figure of Aladdin and his wonderful lamp, the symbol of human imagination.



The University of Baghdad . . . a circular campus free of cars surrounded by a tr


AERIAL VIEW OF THE UNIVERSI
PLAN FOR GREATE
DEDICATED TO SUMERIA, ISIN, LA
FRANK LLOYD WRIG

y a traffic and parking ziggurat . . . semicircular university buildings abut the inner e

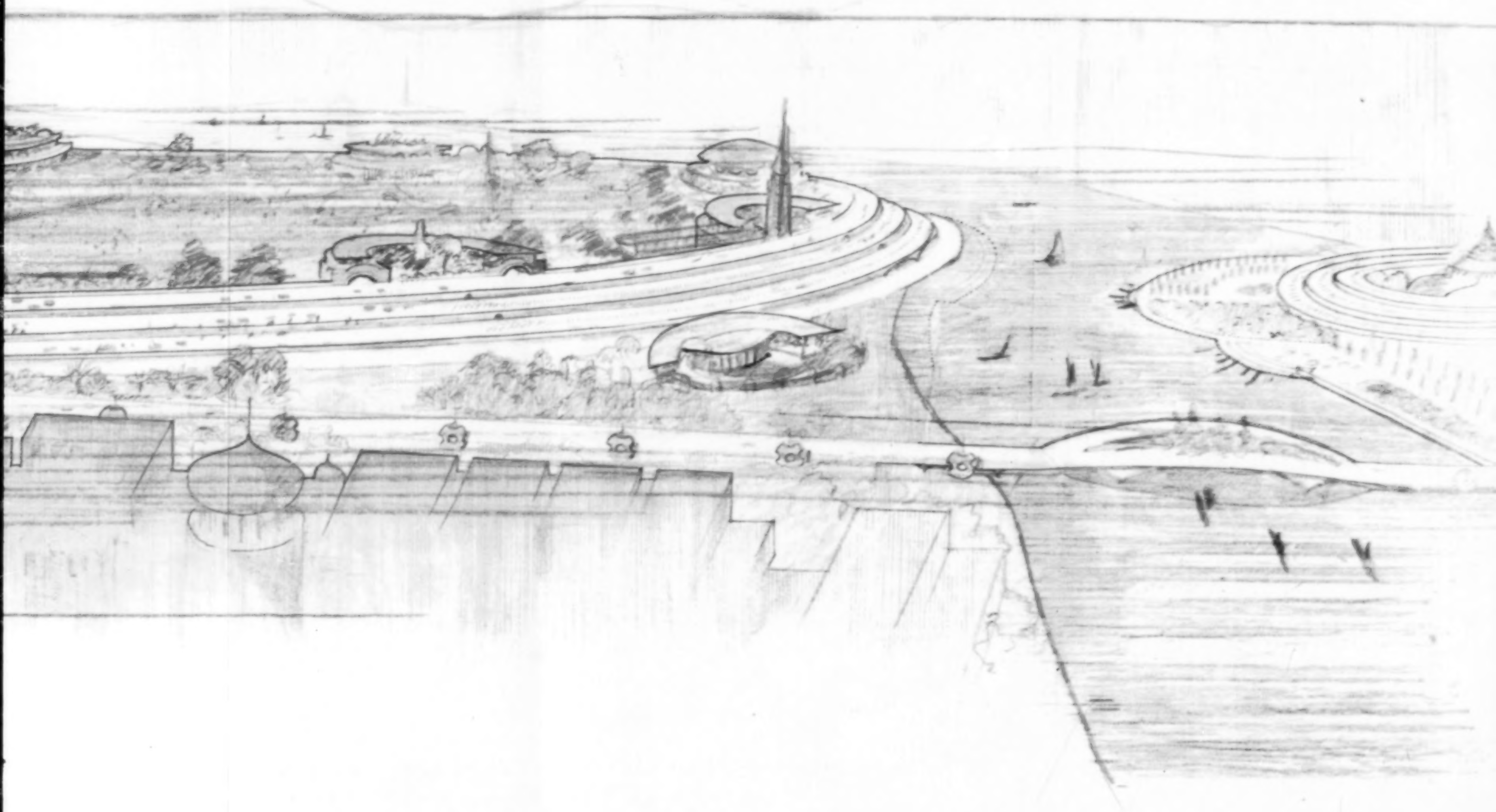

RSITY AT HEIGHT OF 300 FEET
TER BAGHDAD
, LARSA AND BABYLON
IGHT ARCHITECT

abut the inner edge of the ziggurat; radio and TV studios are at the center of the campus.

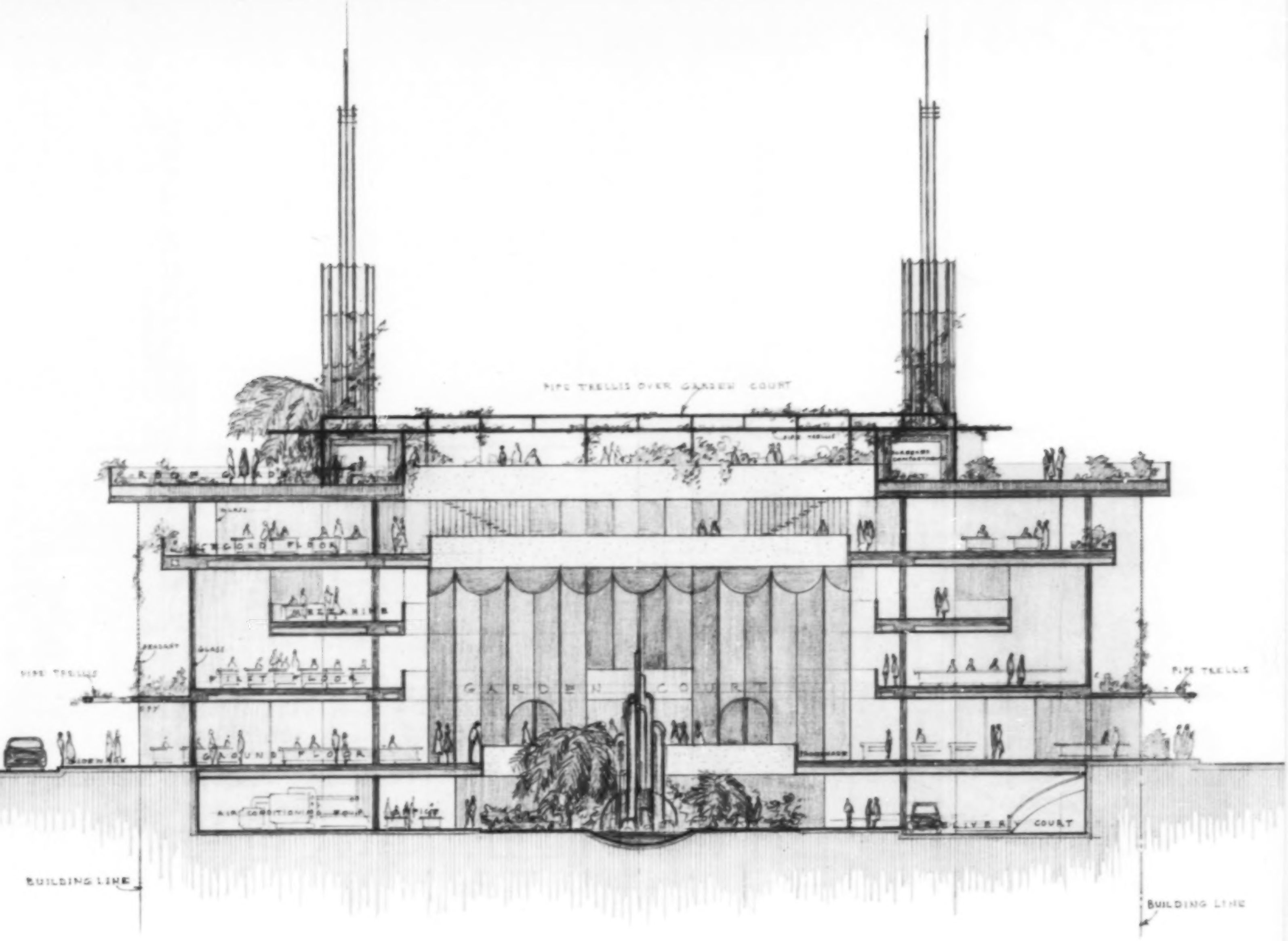
FLLW: These drawings are voluntarily submitted to the Development Board prompted by the respect and admiration I have for the culture of the Middle East, which is now in danger. The use of the ziggurat has been explained elsewhere. Here, the ziggurat is the generic form for parking the entire traffic of the various buildings of the university. The campus itself is thus free of cars with entrances easily available from each level by way of multilevel courts in the various department buildings, which are placed at the inner circumference (curriculum) of the ziggurat. As a matter of course, as many buildings as are necessary could join the curriculum.

The central features of the campus are radio and television studios (Baghdad now has the first television station in the Middle East) arranged around a reflecting pool with fountains. The necessary antenna towers thus become vertical features of the design.

The diameter of the campus and the number of levels in the ziggurat could vary depending on the needs of the University. The ziggurat winds in full view of the Tigris and travel to and fro would not only be safe but a pleasure. Three quick access ramps would allow short cuts going outward or inward from any level.



## Post and Telegraph Building: concrete filled steel tubes support cantilever floors.


PIPE TRELLIS OVER GARDEN COURT
ROOF GARDEN
SECOND FLOOR
MEZZANINE
GLASS
PIPE TRELLIS
FIRST FLOOR
GARDEN COURT
PIPE TRELLIS
SIDEWALK
GROUND FLOOR
AIR CONDITIONING ROOM
DELIVERY COURT
BUILDING LINE
BUILDING LINE

TYPICAL CROSS SECTION

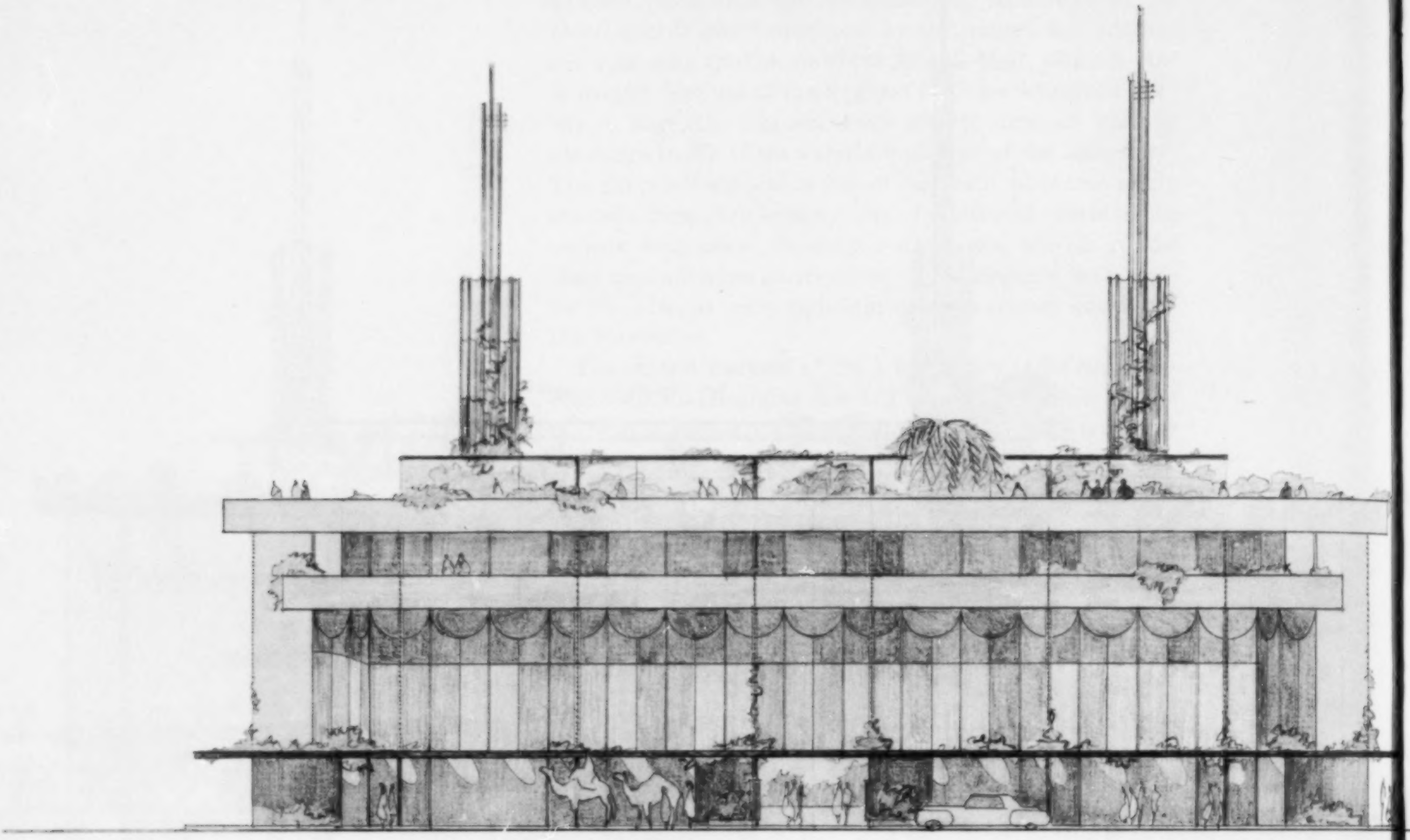
FLLW: The basic aim of this design has been to produce a building by extremely economical methods and greatly simplified construction. The basis of the construction is the hollow steel tube filled with concrete during construction (similar to the so-called "Lally" column). The floors are concrete slabs cast hollow to receive wiring and air-conditioning ducts.

The building is designed around a central court with a green garden at the basement level. Public rooms, offices, and equipment rooms are arranged around the court on the various floors, which cantilever beyond the columns to form balconies or sunshades. The roof slab is insulated with 16 inches of earth planted to greenery.

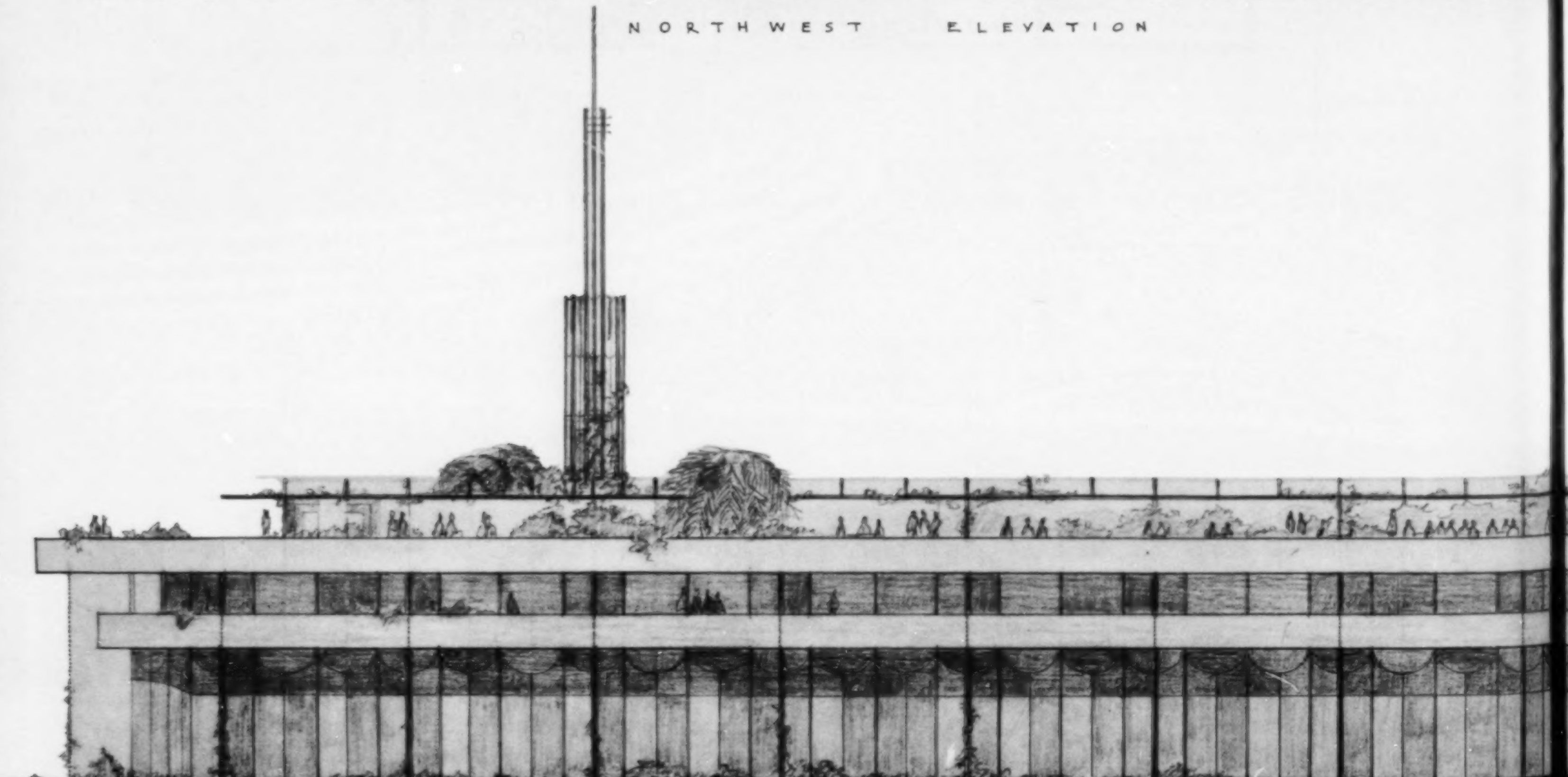
From the terrace level, a suspended arbor of steel tubes is hung in front of the great glass walls to afford additional shading from the sun. The terrace itself is sheltered by an overhead trellis of the same steel tubes which continues over the garden court as a sun shelter.

The whole structure provides a translucent, well-lighted interior space under adequate shelter in the hot climate of Baghdad. Trees planted in the interior court may be seen from the street through the diaphanous structure.

# Post and Telegraph Building . . . glass walls sheltered under cantilever floor

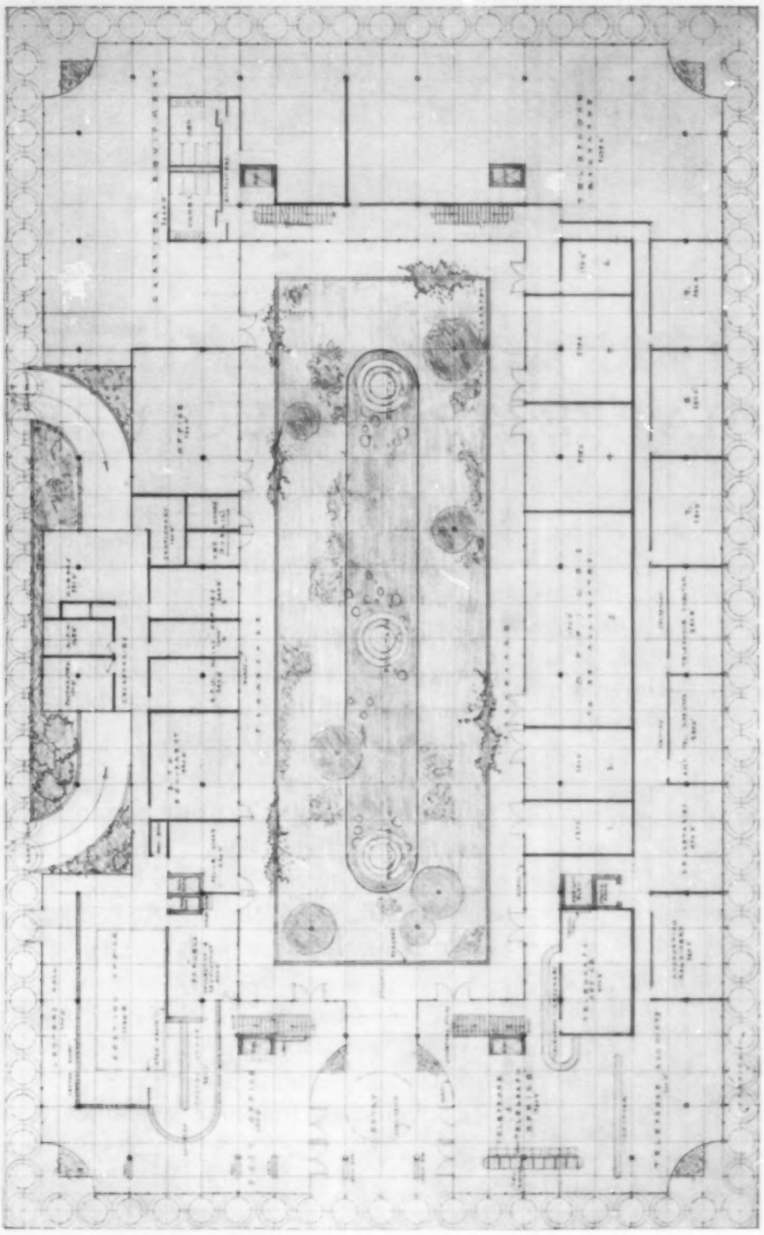


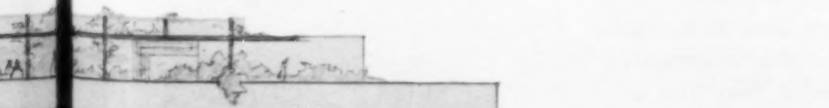
NORTHWEST ELEVATION


1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 22 23 21 22 21

SOUTHWEST ELEVATION

## and roof slabs . . . central court shaded by an overhead trellis of steel tubes.





**FLLW:** In order to make the building more agreeable both inside and outside, the building line has been set back from the street. In all stories the glass walls—set in mastic free of the structure itself—are placed well back under shelter to avoid sun heat and glare. An arbor of steel rods suspended from overhead is arranged as an outer pattern to carry suitable greenery.

# WHAT IS ARCHITECTURE?

FRANK LLOYD WRIGHT
from the London Lectures, 1939

What is architecture anyway? Is it the vast collection of the various buildings which have been built to please the varying taste of the various lords of mankind? I think not. No, I know that architecture is life; or at least it is life itself taking form and therefore it is the truest record of life as it was lived in the world yesterday, as it is lived today or ever will be lived. So architecture I know to be a great spirit. It can never be something which consists of the buildings which have been built by man on earth—mostly now rubbish heaps or soon to be. Architecture is that great living creative spirit which, from generation to generation, from age to age, proceeds, persists, creates, according to the nature of man and his circumstances. That is really architecture.

In all buildings that man has built out of earth and upon the earth, his spirit—the pattern of him—rose great or small. It lived in his buildings. It still shows there. . . . Today we look back upon the endless succession of ruins that are no more than the geological deposits washed into shore formation by the sea—landscape formed by the cosmic elements. These ancient buildings were similarly formed by the human spirit. This is the spirit elemental of architecture. . . .

Any building is a by-product of eternal living force, a spiritual force taking forms in time and place appropriate to man. They constitute a record to be interpreted—no letter to be imitated. We carelessly call these ancient aggregations architecture. Looking back upon this enormous deposit to man's credit, and keeping in mind that just as man was in his own time and place so was his building in its time and place, we must remember that architecture is not these buildings in themselves but far greater. We must believe architecture to be the living spirit that made buildings what they were. It is a spirit by and for man, a spirit of time and place. And we must perceive architecture, if we are to understand it at all, to be of the spirit of man that will live as long as man lives. It begins always at the beginning. It continues to bestrew the years with forms destined to change and to be strange to men yet to come.

The giant building industry is gradually growing more efficient. Since World War II, in fact, output per building construction worker in the U.S. has risen a surprising 13 per cent.

# The rise of building productivity

BY STEPHEN G. THOMPSON

Few industries are more widely pitied and roundly censured than the U.S. construction industry. Bedeviled by featherbedding and beset by archaic production practices, the industry is widely regarded as the awkward and laggard stepchild of the otherwise brilliant American economy. And, in some respects, it is. In recent years for example, the improvement in construction productivity has been only one-half as great as the rise in productivity of the economy as a whole. And in 1956 and 1957, in fact, output per worker in the construction industry actually declined from the 1955 peak (see chart, page 104).

And yet it is time for the construction industry to stop apologizing for its performance. Actually building is one of the most productive enterprises, in terms of gross output, of any on the industrial scene. The annual output of a construction worker, as the chart on page 104 shows, is double that of the average U.S. worker. And in the decade since World War II, his efficiency has improved significantly. What is more important, building productivity seems to be swinging sharply upward right now. Although authoritative data is scant, the available figures indicate that:

▸ Average new building output per contract construction worker (in constant 1947-49 prices) was 12.7 per cent greater last year than in 1948. In comparison, last year's average Gross National Product per worker in the economy as a whole was 22.9 per cent above 1948.

▸ Building productivity has been advancing in rolling surges. In roughly matching the steady, more even-paced gains in GNP productivity, new building has scored better than GNP in five out of the nine years since 1948 (see chart).

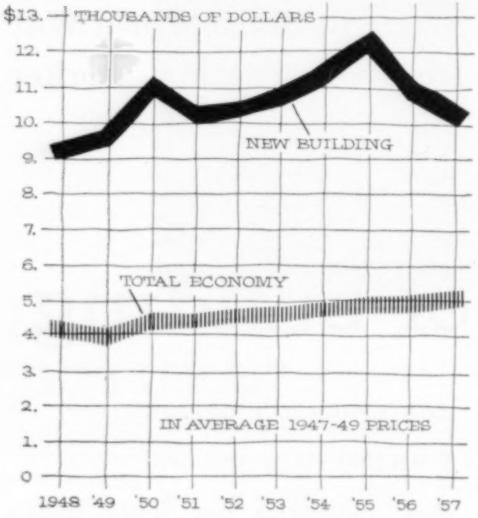
▸ Since World War II, wage increases in construction have not been out of line with those in industry generally. From 1948 to 1957, average hourly earnings of building construction workers rose from $1.85 to $2.96— or 60 per cent. In the same period, average hourly earnings for manufacturing workers advanced from $1.35 to $2.07— or 53.3 per cent (see chart). But if the wage increases in both fields are compared with 1939, construction wages rose only 217 per cent as compared with 227 per cent for wages in manufacturing.

## No standardized output

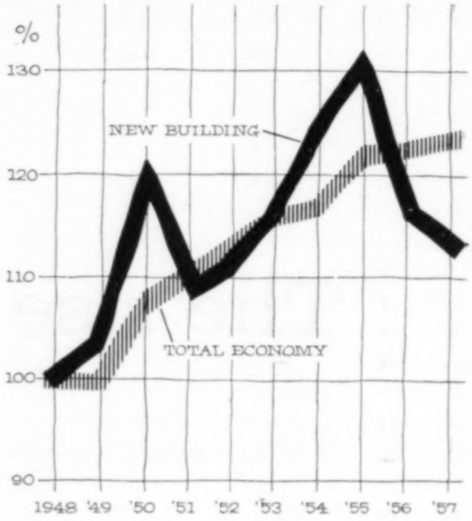
One reason there is so much misinformation and misconception about the productivity of the building industry, of course, is because of the complexity of the industry. There is very little standardization in building (except in prefabricated and tract housing). Each unit of "output" differs substantially from every other unit of "output" in shape, size, materials, etc. It is, consequently, extremely difficult to calculate changes in "output" per manhour.

Moreover, although building accounts for some 10 to 14 per cent of the nation's Gross Product, the federal government gathers only crude statistics on building output and employment, and the industry itself

## THE BUILDING INDUSTRY'S PRODUCTIVITY



ANNUAL OUTPUT PER WORKER — The average new building contract construction worker produced a peak $12,131 worth of new construction in 1955. By 1957, however, this average output had declined to $10,462. Meanwhile over the postwar-boom decade, 1948-57, average Gross National Product per employed person (including Armed Services personnel and expenditures) advanced steadily from $4,009 to $4,929. The seemingly high "value" of new building per worker is not a measure of construction productivity vis-a-vis other industries, however. It mainly reflects the fact that building workers put together or install many costly components, such as structural steel shapes, elevators, and furnaces, which were initially fabricated or "produced" by nonconstruction workers.



CHANGES IN PRODUCTIVITY—The chart above compares productivity (output per worker) in new building contract construction with productivity in the U.S. economy as a whole. Since 1948, output per worker in new building has risen 12.7 per cent (in constant 1947-49 dollars). Meanwhile the productivity of all U.S. workers (Gross National Product divided by total employment) has risen 22.9 per cent. The 1951 setback in building productivity coincided with materials restrictions after the outbreak of the Korean War. The 1956-57 falloff reflects the record-spending and record-employment in the years just preceding the current recession. However, productivity is expected to turn up this year, as many individual building workers labor more conscientiously—to avoid recession layoffs.

compiles almost no useful data. And it is a rare builder who keeps very detailed cost records on his own building operations — masonry, plumbing, electrical work, etc.—or who will discuss them freely.

It is also enormously difficult, of course, to keep tabs on the number of "man-hours" worked in the construction field. For unlike most industries, construction has few large firms; it is composed of thousands of small contractors, behind whom stand an army of subcontractors. Building labor, moreover, is comprised of a collection of Balkanized "crafts" that often engage in bitter, disruptive jurisdictional rows that can cripple or delay a project for months. How can anyone keep accurate track of the number of productive man-hours worked under such elastic conditions?

To further complicate matters, real gains in construction productivity are often obscured or concealed by price increases that accompany the introduction of new materials and equipment. These new materials may raise the quality of new buildings substantially, or even change their character so much that they are no longer truly comparable to older buildings. Some examples: air conditioning, operatorless elevators, major upgrading in lighting and electrical standards.

Collectively, and by separate crafts, building labor gets lambasted regularly for its lack of productivity. Indeed, productivity in the limited sense of individual effort and efficiency is what most people refer to when they criticize the lack of "productivity" in building. Actually, of course, labor productivity is only one factor affecting output per manhour in the construction field, and individual effort may influence productivity much less, for example, than increased mechanization. Still, there is no denying that in some instances building unions have enforced restrictive practices and that these practices have raised building costs and inhibited productivity. But recently, organized labor has been steadily retreating from its make-work, stretch-out, antimechanization positions. The antifeatherbedding code recommended last winter by the National Constructors Association and the AFL-CIO Building Trades Department points the way to further reform in this direction.

And many construction workers have, in fact, been working more assiduously in recent months, and thus increasing their productivity. Builders regard this as an incidental benefit of the current economic dip and a reflection of the efforts of each worker to demonstrate his individual skill and value, and thus minimize his chances of being laid off if construction work suffers any marked decline in volume.

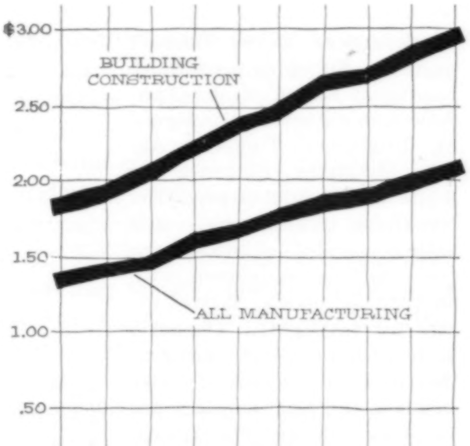
But the most important reason for feeling sanguine about the trend of construction productivity is the fact that there is a whole series of advances in building techniques and practices that are contributing forcefully to increased productivity. All in all, it is reasonable to conclude that these innovations in design, materials and building techniques have boosted productivity considerably more than the 12.7 per cent that the government's crude statistical series indicate. In mass home building, in fact, which has more repetitive processes and standardization than any other segment of construction, FORUM believes that the most efficient big builders have probably increased their productivity about 20 per cent since the war.

The best way to get an accurate picture of productivity in the building industry is to take a close look at its component parts. Here, therefore, are some of the specific and calculable improvements in building technology that support FORUM's contention that building productivity is on the rise:

*Excavations.* Over the past 20 years, the dollar costs of removing a cubic yard of earth have hardly changed. The reason: bigger and better excavating equipment has offset the increased cost of wages and materials. The major improvements in productivity have come from the use of power shovels with capacities of up to 2½ cubic yards of earth compared with only ¾ to 1 yard in older machines; huge trucks that now carry away 12 to 14 cubic-yard loads, rather than 6 to 8 yard loads; trimming up loose material for the big shovels with small bulldozers, instead of by hand shovels; better compressors, faster drills, and better drill tips.

*Steel frames.* A degree of increased productivity has been achieved by the use of large cranes instead of derricks to lift steel into place, and by the use of high-strength bolts, instead of rivets. (Bolting crews consist of only two men each, whereas riveting requires four-man crews.) One large structural fabricating firm reports that use of a crane resulted in a saving of about 10 per cent in steel erection costs recently, compared with a similar job a year earlier. The newest electric generators can operate up to ten welding machines at once, cutting fuel costs in half.

**WAGE RATE CHANGES**



**AVERAGE HOURLY WAGES** in the construction industry rose $1.11—or by 60 per cent—between 1948 and 1957. This compares with an advance of 72¢ an hour—or 53.3 per cent—for all workers in manufacturing industries. The difference helps explain the relative lag in productivity in the building industry. But, surprisingly, over the longer term (since 1939) the increase in construction wages has been less than the wage increase in industry generally.

*Metal floors.* The cellular metal floor that has come into widespread use since World War II helps speed up construction because it can be installed in any weather. It also has the advantage of cutting down weight loads, thereby trimming structural steel requirements and expenses. This weight saving can be of immense value in buildings for sites that have poor foundation conditions. Says a spokesman for one of the largest floor makers: "We know we can produce a metal floor with full electrical raceway flexibility and future maintenance savings advantages for no greater cost than a concrete floor that would lack these advantages." The tremendous potential in these floors is the introduction of forms that include ducts suitable for both heating and air conditioning. This promises major savings on both metal and metal-working labor by eliminating separate air-conditioning ducts.

*Fireproofing.* A one-coat sprayed-on "Limpet" asbestos fireproofing, which has won approval in a number of cities, can be sprayed directly onto metal decking, or applied to beams and girders that are covered with metal lathing. Such fireproofing has a 3-hour fire rating, has high value as an acoustical, insulating, and condensation control material, and when applied to a metal deck has reduced costs 15 to 20 per cent, compared to concrete or plaster fireproofing.

*Structural concrete.* Use of long-boom cranes instead of elevator hoists saves up to 50 per cent on concrete placing costs under optimum conditions. These cranes were introduced in the late 1930's; by 1948 they could be used on buildings 12 to 14 stories high. Today the latest models service structures of 20 stories and higher.

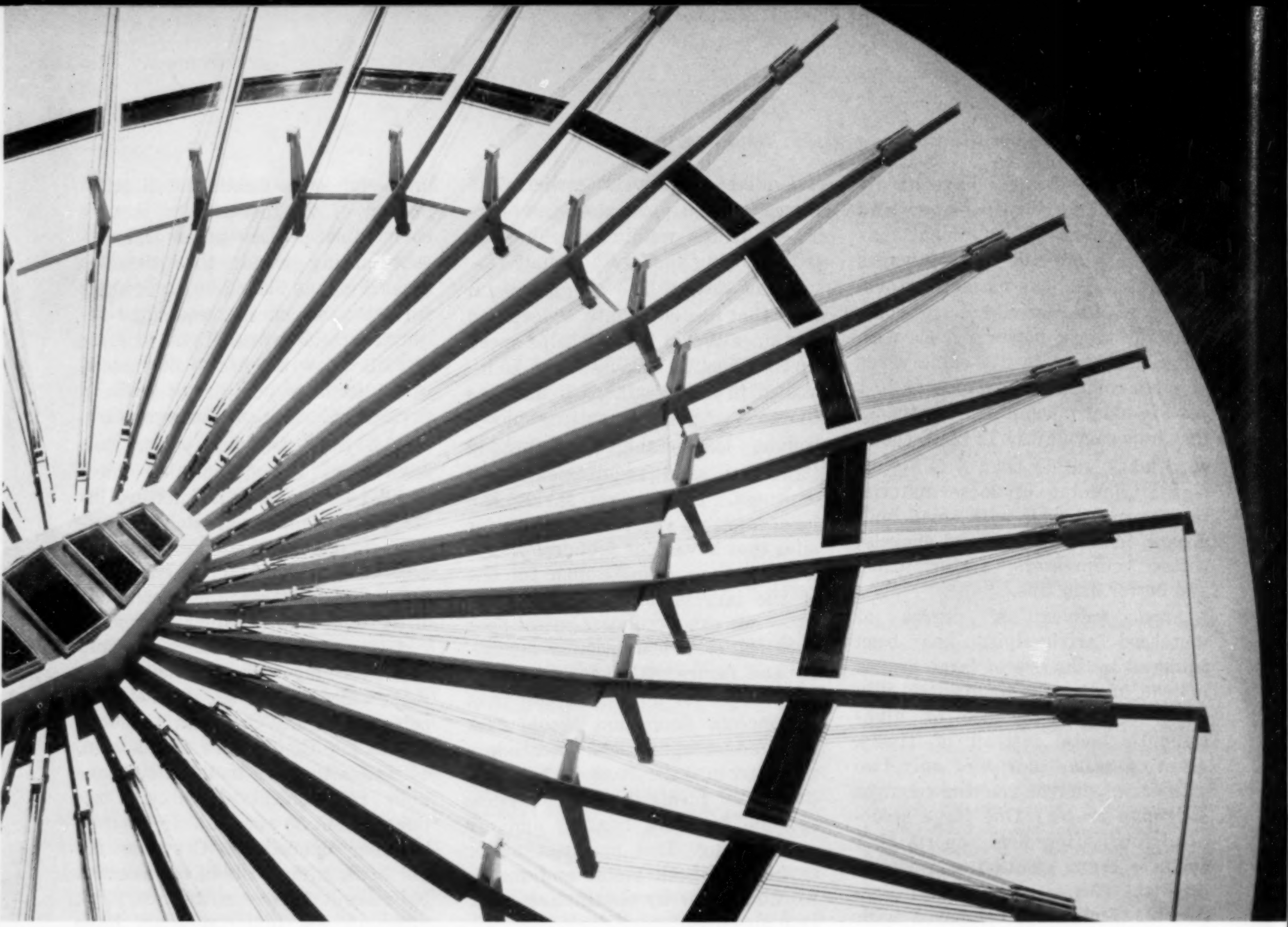
*Electrical work.* Opinions are divided on the trend of productivity in this field. Critics speak unkindly of the output of the electrical workers. But lighting standards have virtually doubled in the postwar building boom: office lighting of 50 to 80 instead of 20 foot-candles is now commonplace. Low-power fluorescent lighting provides three times as much light as incandescent lighting for the same current cost, and requires smaller wires. Higher voltage circuits allow the use of 30 instead of 15 fixtures per circuit, with a further reduction in wiring requirements. Stud guns and power tools have been introduced that have boosted both wiring and fixture installation productivity. Rolling scaffolds in place of ladders have increased ceiling work efficiency, and a concrete floor trenching machine is eight times faster than chiselling.

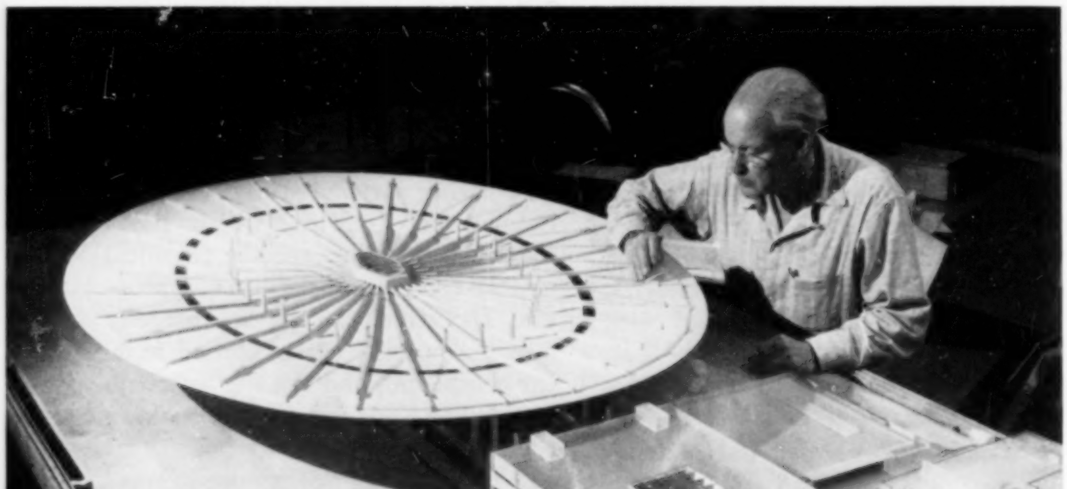
*Tile.* With new adhesives and new space-lug tiles that have come into widespread use in the past seven years, Lee Crowner, president of the Tile Contractors Association, estimates that tile installation man-hour requirements have been reduced about 33 per cent. In his own building operations, Crowner reports, his tiling costs have advanced only about 10 per cent since 1952, although his material costs have risen about 10 per cent, his tile mechanics' wage rate 23 per cent, and tile laborers' wage rate 40 per cent.

Dramatic new gains in tiling productivity are promised through a "thin-setting" mortar bed process now being promoted by the Tile Council of America, which holds patent rights for special chemical mortar compounds used in the process. Dry tiles can be set directly into the special, easily spread mortar compound, and the tile setter no longer has to devote time to soaking each tile, and carefully "floating" and maintaining "damp conditions" on the mortar bed. Thin-setting reportedly permits a tile setter to do three times as much work in a day as he can by conventional methods.

Describing a tiling contract on the new Lake Air Junior High School in Waco, Texas, Tiler C. O. Montgomery says: "This school has 36,000 square feet of wainscot. Normally tile labor on it would run about 80 cents per square foot. We did the job at 23½ cents per square foot. It took us 60 working days using five mechanics. Normally, to do the job in

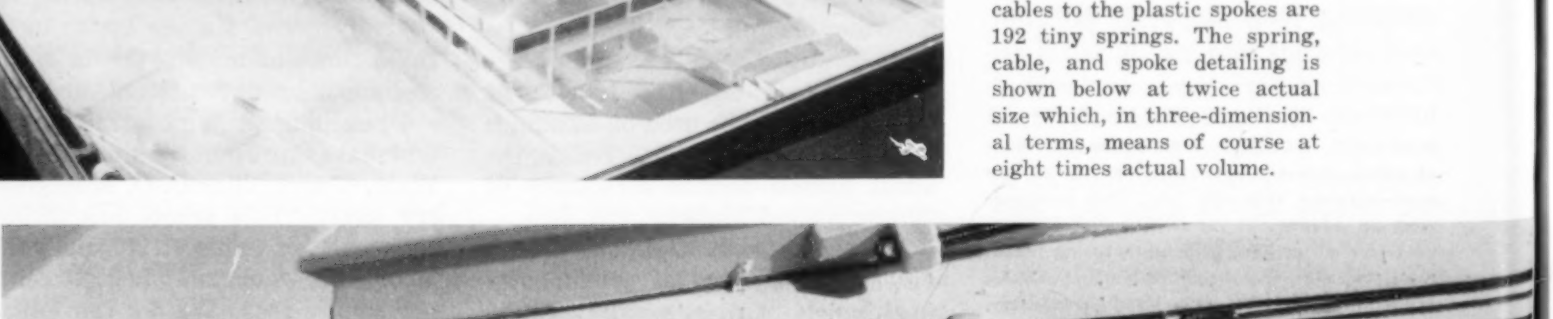
*continued on page 204*





**Modelmaker** Devon Dennett adjusts a fitting on a partially completed model of the Pan-American air terminal designed by Engineers Tippetts, Abbett, McCarthy, Stratton, for a site at Idlewild airport. The terminal's cantilevered and cable-suspended elliptical concrete roof is reproduced with heat-molded plastic, painted except for "skylights." The scale is ⅛ inch to 1 foot. Securing the model's five-strand wire cables to the plastic spokes are 192 tiny springs. The spring, cable, and spoke detailing is shown below at twice actual size which, in three-dimensional terms, means of course at eight times actual volume.

PHOTOS: LOUIS CHECKMAN



A growing demand for precision models has propelled the architectural modelmaker into the machine age.

# The miniature boom

BY JANE JACOBS

In the past few years, the cardboard, wood, and plaster architectural models of prewar days, products of painstaking handcraft, have been supplanted by fantastically precise, gleaming, plastic and metal models, the product of an equally painstaking and skilled machine craft combined with handwork. In effect, modelmaking has been catching up with the architecture it reproduces; for into the past ten years modelmakers have telescoped revolutionary changes in machine methods, use of machine-made materials and concepts of space that have been 40 years evolving in architecture itself.

Three changes have produced the model revolution: a new demand on the part of architects and their clients for exceedingly realistic and accurate model design studies; a new material, the acrylic plastics; and new mechanized techniques adopted by modelmakers. Since World War II some two dozen architectural modelmakers have set up shop and are now equipped with the power tools to machine plastics into an enormous variety of components for models. These newcomers have joined the 30-odd makers of old-time models or of product and engineering models who have now adapted themselves to the new techniques of reproducing the new architecture.

The new models, miniatures though they are, can hardly be considered simply imitations of buildings. They *are* buildings, with their own complex engineering and construction problems. The minute spring fastenings for the roof cables of the Pan American air terminal model on the opposite page, for example, are all but invisible in the model, and in fact depart from the engineering in the cable-hung roof of the actual terminal building; but they are necessary for giving resiliency to the model's own fine, twisted-wire roof cables. The Manufacturers' Trust model (page 110) had to have its own complete little air-conditioning duct system concealed in the ceilings, to carry away the broiler-oven heat created by its own lighting system. The columns of the Pittsburgh Hilton model (page 111) double as carefully calculated tension rods. Rabbeted joints, V joints, positioning grooves, or texture scorings on today's architectural models like these are accurate to .001 inch, so accurate that allowance must be made for a coat of paint.

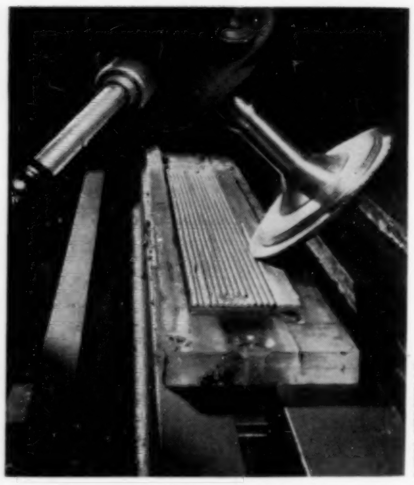
This is serious work indeed, and costly. The Manufacturers' Trust model, for example, cost $7,000, the Chase Manhattan model (FORUM, April 1957), $15,000. A complete and meticulous model of a large building—one that can stand close-up photography without shrieking "model"—can hardly cost less than $2,000, and, depending on size, complexity, quality, and the number of change orders issued while the work is in progress, may run as high as $22,000, the cost of the final Air Force Academy model which took six weeks and 3,567 man-hours to build. However, inasmuch as a cruder handmade model of the Air Force Academy cost $30,000, even a $22,000 job by a mechanized modelmaker can represent something of a bargain.

### Miniature investments

Workmanship and costs of this order are not undertaken with the purpose of charming the public, except as a by-product. These awesomely detailed and complete models are primarily for study by designers, architects, and their clients. They are shrewd miniature investments made to avoid full-size mistakes.

From the time of the first rough preliminary concept of a building design, to the last stages of lighting, color, or texture refinement, models have now become vital working tools for design, experiment, and decision. They are depended on for jobs which used to be done entirely with paper, pencil, and painted perspectives. Peer over the board of an architectural designer today, and you are likely to find him cutting little cardboard walls with a razor blade. Observe a layout expert, and you see him pushing tiny drill presses or desks around in a transparent box. Trail behind a metal fabricator and you may find him scrutinizing a

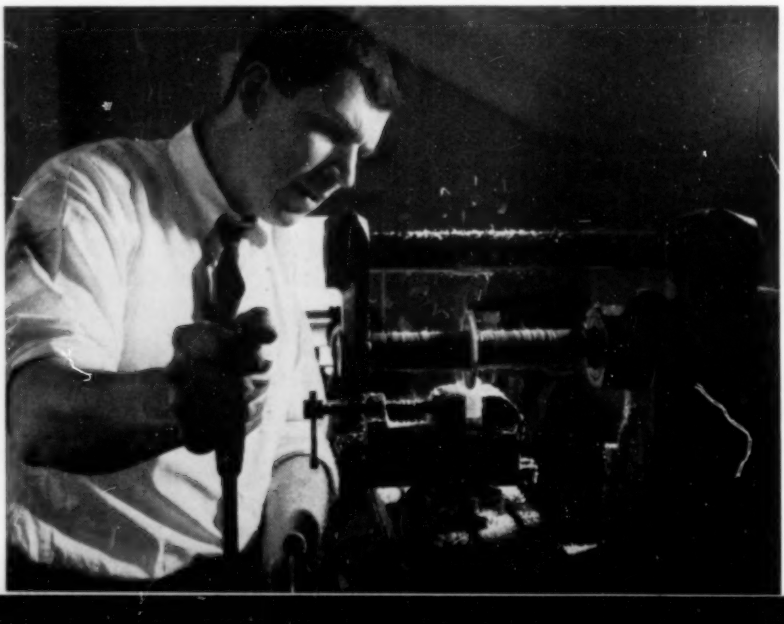
**Machining plastics** for models is very similar to machining metal; the plastic is about as hard as copper. At right, a milling machine in the model shop of Theodore Conrad is scoring "louvers" into plastic. To score "bricks" a multibladed circular cutter is used, and for a scale of 1/16 inch to 1 foot, such scorings number 80 to the inch. Below, Conrad, the man in the center, trims the edges parallel on a series of plastic strips with a milling machine, in the main machine workroom of his Jersey City model shop.



LOUIS CHECKMAN

LENI ISELIN

**Milling out** plastic stairs, Modelmaker Thomas W. Salmon cuts a stair section into a plastic bar; the shaped bar will then be sliced horizontally into identical components for assembly.



LENI ISELIN

life-size mock-up of a piece of skyscraper wall, made of painted wood. Look in on an architect and his clients in conference and you find them debating the fittings in a miniature lobby, complete with elevator buttons and passengers.

This developmental use of models will be described in detail in a future issue of FORUM. In this article on the business of modelmaking, it is sufficient to point out that the elaborate and realistic final study models make the most spectacular exhibit models as well. They are far more impressive, as a rule, than models built only with exhibition or exploitation in mind. The final study model of Lever House, for example, was given to the Museum of Modern Art after its design work was done; it has since been admired in New York, Paris, Berlin, and Brussels, and presumably still has years of travel ahead of it. The Pan American air terminal model (page 106) has been shipped to the Brussels fair as a U.S. exhibit, but its main purpose was to embody design changes worked out from a previous elaborate model of this same project.

Occasionally the extreme verisimilitude needed for a study model and the permanence and safety desirable in an exhibit model are not altogether compatible. A recent dramatic example of this was a $12,000 model which went up in smoke—fortunately not before it had done its job as a study model. The model, of the projected Pepsi Cola office building to be built in New York, by Architects Skidmore, Owings & Merrill, featured what appeared to be 12,000 tiny incandescent lights in its ceilings, gleaming like an infinitude of stars through its clear plastic windows. A dazzling and lovely sight. To have used tiny incandescent bulbs crafted to this model's scale of ¼ inch to 1 foot (actually available from Japan) would have required enough electricity to light the Lincoln Tunnel. Instead, Modelmaker Theodore Conrad set neon tubing behind the ceilings, to shine through 12,000 simulated lamps. Even this method required enough electricity to light five average houses—all concentrated into a space smaller than a closet. And even though the light was from "cold" tubing, the confined heat given off was comparable to that from a stack of toasters. A timer, built into the wiring, automatically shut off the switches after 30 seconds to give the model time to cool before the lights went up again. Alas, after six months of use, the timer stalled one evening and was not disconnected. In the dead of night, it went on again, stalled again, this time with the switches open and lights burning. By the time a courageous maintenance man had disconnected the wiring and quenched the flames, the model was destroyed and so was much of the furnishing in the conference room where it stood.

### Enter the machine

Machine techniques and plastics both began to be used in the making of architectural models shortly before World War II. But the professional mechanized modelmaker did not fully come into his own until after the war. What happened can best be summarized in the history of Jersey City Modelmaker Theodore Conrad, who has been a leading innovator and who now, with twenty men working almost exclusively on architectural models, has one of the largest and most successful model shops.

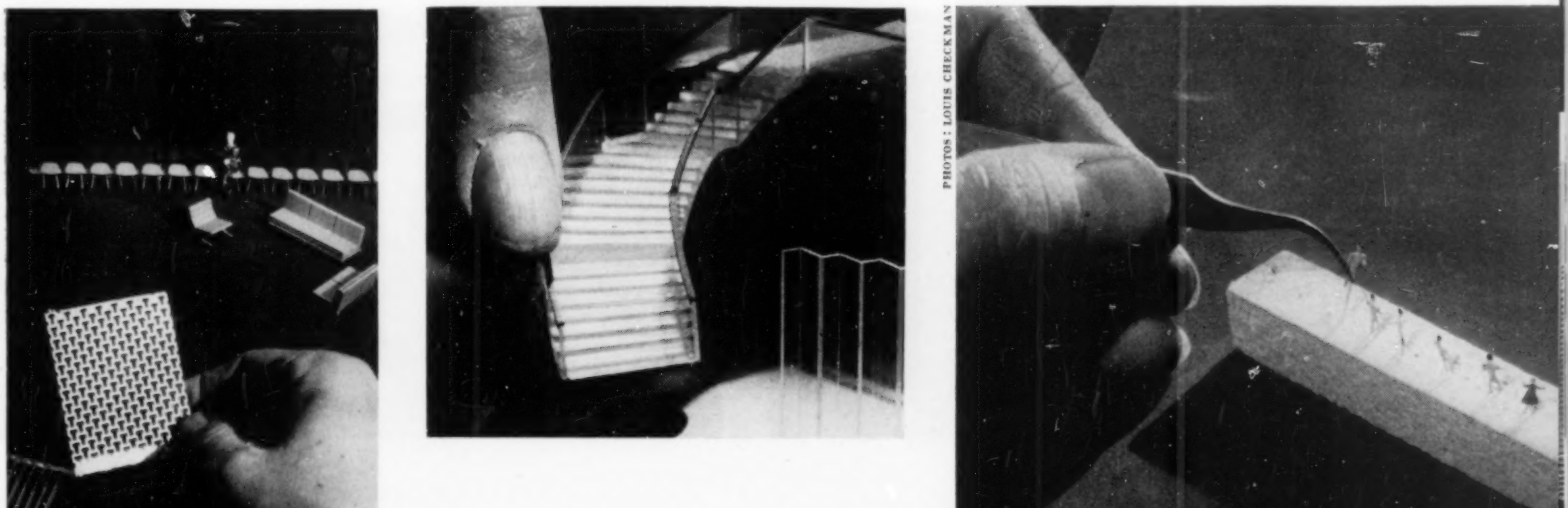
Conrad, who is now 47 years old, decided to go into the modelmaking business for himself in the mid-thirties, after several years of making cardboard models in the offices of the late Harvey Wiley Corbett, beginning while Conrad was an architectural student. Corbett, one of the architects of Rockefeller Center, was unusual for his time because he regularly used models as both study and selling devices.

To maintain his own shop, Conrad realized, he would have to meet the modelmaking competition of architectural students and young architects willing to work 60 or 70 hours a week for architectural firms (for 40-hour-a-week pay). The best way to beat this competition, he figured, was to mechanize. This strategy might have remained a wistful dream if an old friend had not turned up promoting a little die-cast power-driven scroll saw designed to sell for $19.50. The friend claimed this saw could do a better cutting job than a ponderous $500 machine, but no one, except toy merchants, would take the small machines seriously. Conrad did. Backed by his father, an ex-brewery manager, he installed a complete shop in the basement of his home in Jersey City.

His timing was good. Architects for the New York World's Fair soon gave him work. Even more important, for future demand, the General Motors Diorama exhibit at the Fair (by Industrial Designer Norman Bel Geddes) excited a great many people about the potentials of models; so did the use of training models during the war. But the biggest boost came in the immediate postwar years, during what Conrad and his competitors call their "magazine era." Because of material shortages, not much new building was yet to be seen. Editors of popular magazines, judging that their readers were avid for a glimpse of the wonders of postwar building, especially houses, decided to fill the gap by publishing models—but models so realistic that the photographs would look like full-scale buildings. The captivating results, and the opportunities for studying design effects with immense precision, were not lost on architects.

Meantime, the acrylic plastics were becoming available again. Before the war, these transparent plastics had been used for models in a

**Die-cast furniture** and fittings for models, below, are from the shop of Theodore Conrad where exterior decorative screening for buildings comes by the inch instead of the yard. For the staircase in the center photo, Modelmaker Devon Dennett has joined a black plastic stair rail to the clear plastic by a perfect V-joint. The windscreen beside the stair is formed of plastic panels with rabbeted joints. Like the Conrad die castings, these are ⅛ inch to 1 foot. At right are Dennett's painted die-cast "children" at 1/16 inch to 1 foot, for models of school buildings. They are pliable for bending into action poses.



PHOTOS: LOUIS CHECKMAN

relatively small way, but now Conrad, along with the rapidly growing number of other mechanized modelmakers, seized on the acrylics as the basic model material. Not only was the plastic visually suitable for models of buildings with large glass areas; it had no grain, it would not shrink, it could be machined to close tolerances, it could be glued without clamps in only a few seconds' drying time, it could be hot formed for curved shapes, and it could be painted—without a primer—to simulate almost any material. Today virtually all models built for permanence are made of plastic, mainly the transparent acrylics. Lately Conrad has begun using glass-fiber reinforced plastics also, poured as a liquid over lasts, to simulate reinforced concrete shells or to shape terrain. This is still an unusual technique, however, as is Conrad's metal-inlay technique illustrated on page 111.

### I-beams and Ionic columns

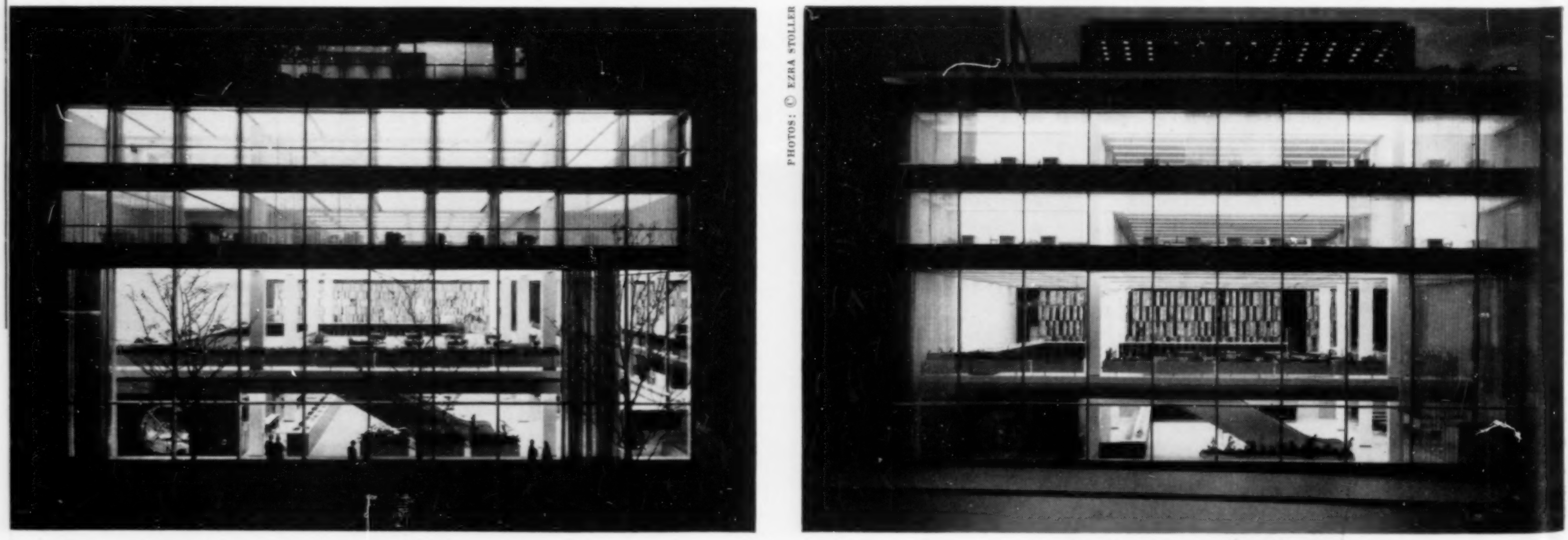
The range of milling machines, drill presses, lathes, saws, grinders, polishers, and paint sprayers which Conrad uses (he has 70 basic machines and 120 electric motors in the shop) is no longer unusual for professional modelmakers. Devon Dennett, a modelmaker in Queens, New York, for example, has a much smaller, three-man operation, but even so, uses more than 30 basic machines in his big, back-yard shop.

With his machines the mechanized modelmaker cuts his minute joints, carves out tiny H-sections or I-sections and chops them off to length, turns stair rails, forms benches, scores little courses of brick and—if necessary—flutes Ionic columns. In his shop, he also makes the cutting and scoring discs to do such jobs.

There is plenty of ingenuity and invention in his work, but it is not the ingenuity of the inspired makeshift. The mechanized modelmaker does not seize on ping-pong balls for water towers, or medicine capsules for roof lighting domes, or aluminum foil for column covers, improvisations which the handcraft modelmaker finds useful and effective. "When you aim at the very closest accuracy possible," remarks Dennett, "you cannot exaggerate or falsify the scale of any detail or object, however unimportant. You can simplify a tiny object, but you cannot misstate its size. 'Almost right' in size will not do." Dennett has used a piece of nylon stocking for the screen in a large-scale (1 inch to 1 foot) door, but on a smaller door he simply omits the screen, instead of using fabric—which would inevitably be out of scale. Most study-and-exhibit models range between 1/16 inch to the foot and 1/4 inch to the foot, with 1/8 inch to the foot most common.

Nor does the professional mechanized modelmaker search for simulated ready-made surfaces to turn to his purposes. He does the simulating if he cannot use the real thing. For example he reproduces with paint sprays the black, brown, and ochre flecks on a cream brick with the same respect for the scale of the flecks as he shows for the scale of brick courses. Thomas Salmon, who has a four-man shop in Manhattan, enjoys watching the astonishment of marble salesmen as they heft a piece of plastic "marble" made by Mrs. Salmon, the painting expert in his shop; or as they touch two samples of "granite," one "polished," one "unpolished," all done with paint on plastic. Wood is the hardest material to simulate, and where wood is called for the Salmons prefer to use very small-grained tropical veneers.

Most of the small objects the professional makers place in and



**Which one is the model?** The photos side by side below show the Manufacturers' Trust Co. bank on Fifth Avenue, New York, by Architects Skidmore, Owings & Merrill, and the model of the bank made by Theodore Conrad. (The model is at the right).

PHOTOS: © EZRA STOLLER

around their models are die-cast in metal. Usually the modelmaker makes a brass master-model of the item and a professional caster then makes a mold and does the casting. Although a typical brass master costs about $60 to make, and the mold costs another $25 or $30, Conrad figures that any object of which he needs at least six copies is more economically cast than made by hand. For the pebbled pavement of a ¼ inch to 1 foot study of the Chase Manhattan plaza and lobby, he spurned coarse sandpaper and instead had the pebbled block die-cast in lead. Sometimes it is even worthwhile to have an uneconomic number of objects cast. For the model of a classical building, Conrad had two Ionic capitals cast because he thought the effect of absolutely identical carving in the two was worth it. Modelmakers sometimes sell castings to each other, and to architectural offices. Conrad does quite a trade in miniature furniture, tree armatures, automobiles, people, lampposts, and the like.

### No production line

But die castings, milling machines and all, the mechanization of modelmaking remains a far cry from the mechanized factory production line. Rather, it is more akin to the tooling-up process of factory production. Once the work is laid out and the machines set, the components of a thousand identical models *could* be turned out, at steadily lowered cost. However, in the model shop, the end product is one model. Conrad reports that the economies of tooling-up vs. production are so well understood by engineer clients that he seldom has any trouble explaining costs to them; their estimates are often surprisingly close to his own. But architects, he says, are more apt to be aghast at his cost estimates, and to wonder how machine work can come so high. Conrad, like all professional modelmakers, keeps close accounts of labor costs on each phase of each job; he reports that typically a third of the labor goes into laying the model out, which is where

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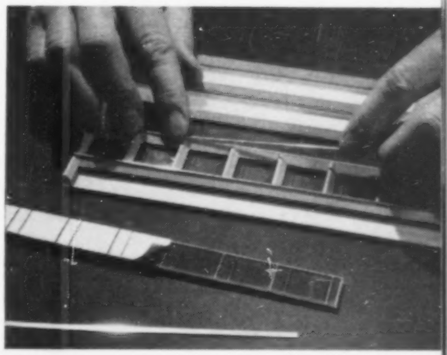
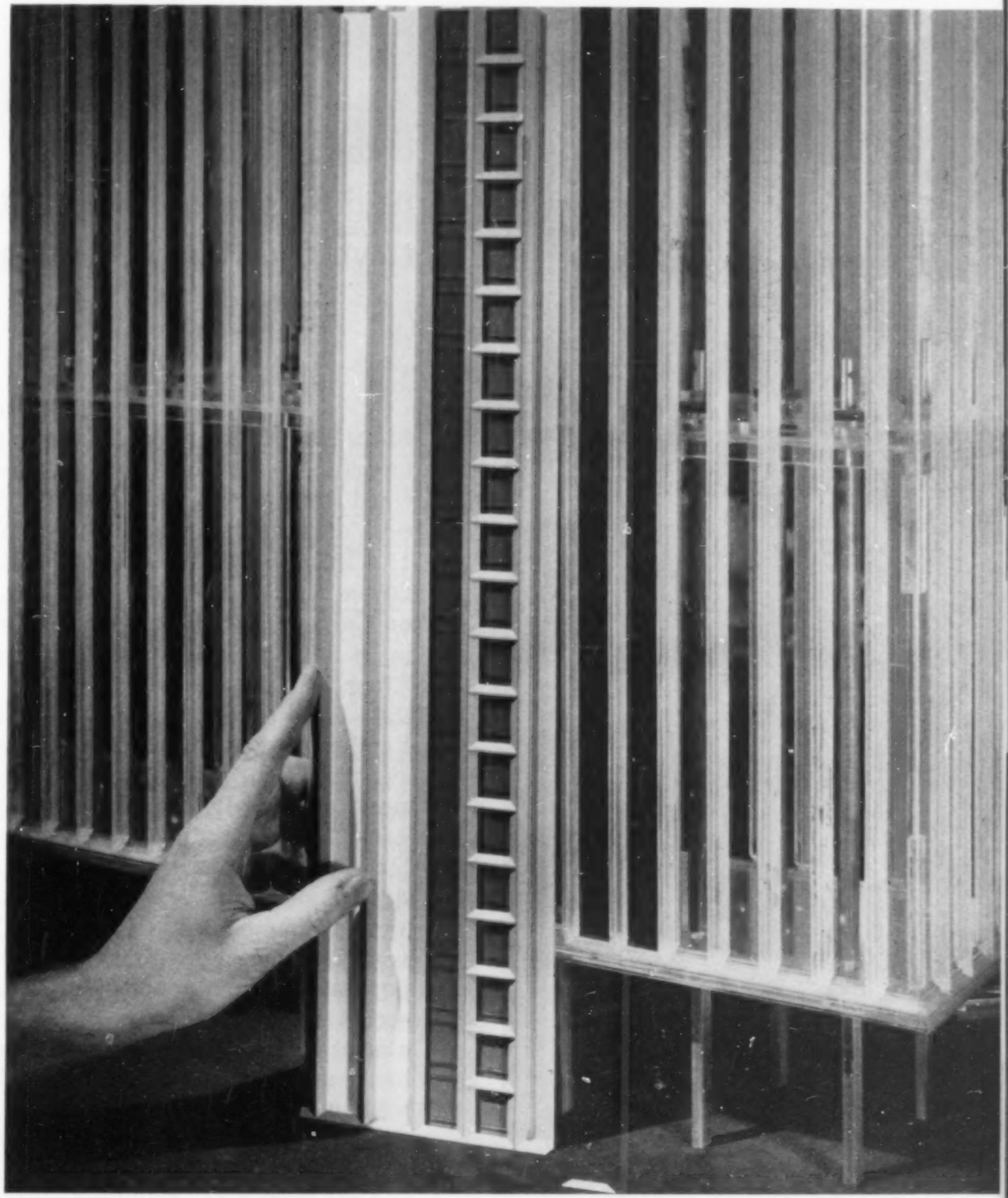
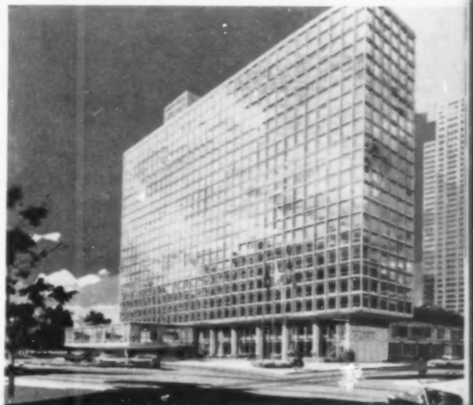


**Assembly** of the model of the Pittsburgh Hilton Hotel (see below) shows Conrad's inlay technique. In the miniature mock-up at right, a strip of metal is being inserted in the face of a grooved plastic mullion. In the foreground is a strip of tinted plastic "glazing." Below, the mock-up is compared with the partially completed model. The hotel's architect is William Tabler.



PHOTOS: (BELOW) ADOLPH STUDLY; (ABOVE) LOUIS CHECKMAN

**Plastic wall** of the Hilton model, eventually to resemble the rendering at right, is shown above with vertical mullions. First the wall was vertically scored, and projecting, thin, vinyl strips inserted. The mullions, also grooved, went over the vinyl and were glued. The short horizontal mullions will go over tinted "glass."



# Industrial "city" of the future?

A new semirural, semi-industrial civilization may be emerging in the U.S. Its outlines can be dimly seen in Calvert City, a small Kentucky town that has become a major chemical center.

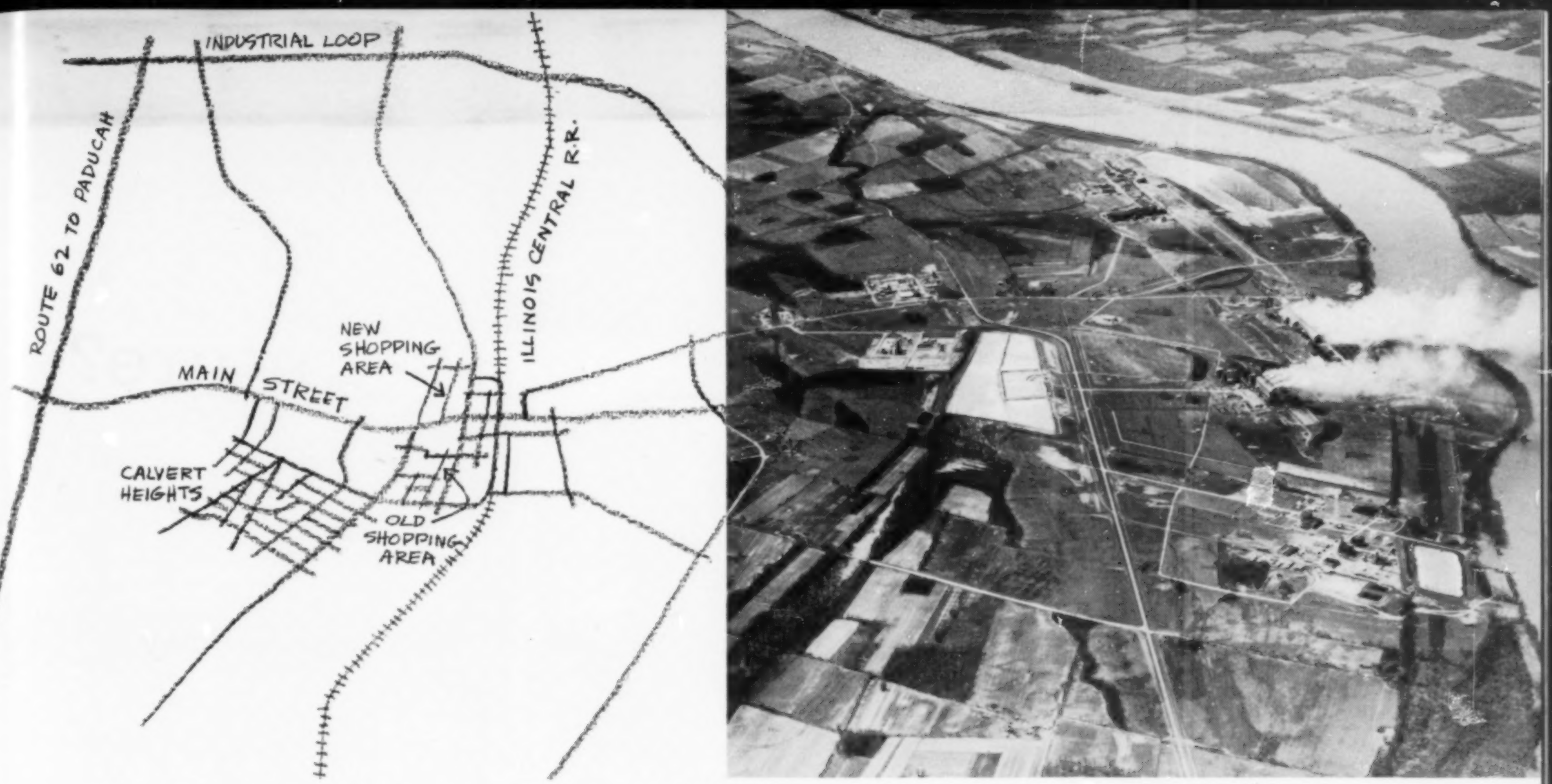
FAIRCHILD AERIAL SURVEYS, INC.

**Main Street** bisects downtown Calvert City, presents a pleasant face of shop fronts, church signboards, and residential lawns. It crosses the Illinois Central tracks at an unguarded and unhurried crossing (top).

Stars have fallen on dozens of small towns in the South in the vast southward movement and decentralization of industry since World War II. But on few towns have they fallen with such sudden impact as on Calvert City, Kentucky, a village in a big bend of the Tennessee River, 15 miles east of Paducah. In the last seven years this tiny hamlet has had its whole way of life changed from a subsistence agricultural community, with roots going back beyond the Civil War, to a large modern chemical center, with dreams of becoming a city in fact as well as name. In seven years Calvert City has more than doubled in population, from about 600 to 1,400, seen its industrial payroll go from almost nothing to 1,700 people, and has encompassed all told some $85 million in new industrial plants, a figure that many a larger community might envy.

Last month $12 million of this industrial expansion, representing additions to previous installations, was completed. But the boom phase of growth seems definitely over for a time, and reaction has set in. Recession and the high costs of building have hit Calvert City hard, as they have such other new industry towns as Pensacola, Florida, and Levittown, Pennsylvania. Calvert City had expected to reach 10,000 in population by 1960, but it probably will have to settle for not much more than its present size by that date. A newly built five-and-dime store closed its doors last year, a spanking new shopping center is feeling the pinch, and the bank's recently installed "drive-in" window has been used but three times to date. The stars have lost some of their luster.

This pause in growth may be a good time to examine, in the sober light of today, the problem of the small town, the most neglected area in urban planning. For Calvert City is a typical small town which, like dozens of others, avidly sought industry for over a quarter of a century, and yet, when it came, was not well prepared to receive it. Like other towns, Calvert City held the conservative view that all it needed to solve its problems was industry, and that planning was something to engage in only if things got into a mess. At the same time, industry, though more conscious of good community relations than ever before, made some miscalculations too. In overcompensation for the bad repute of paternalistic "company towns" in the last century, the new industries leaned over backward to keep hands off the community, and



*Between U.S. Route 62 and the Tennessee River, Calvert City and its new industries view each other across the city line.*

laid themselves open to the charge of indifference. Recession and the pause in growth have only underlined these misunderstandings.

There is no reason to believe that Calvert City and its kind will not continue to grow. Its growth thus far is solidly based on long-term resources. But the small town will have to rethink what type of urban-industrial pattern it wants, what kind of growth is within its means. Since 10 per cent of all Americans live in small towns, and since the bulk of industrial expansion is in the direction of this Ohio–Tennessee Valley "backbone of the nation," Calvert City may be considered larger than life as the epitome of the small-town problem.

**Dark tobacco whistle stop**

The Illinois Central Railroad put Calvert City on the map in 1871 when a whistle stop in the big bend of the river was named after Patillo Calvert, local landowner and grower of dark tobacco, staple of the region. Main Street was quickly laid out at right angles to the tracks, and the town began to grow, seeking the hilly land that would stand dry when the rivers flooded their banks.

World War I dropped the bottom out of dark tobacco, sold almost exclusively to Mediterranean countries for black cigars, and Calvert City entered a long depression, hardly interrupted until the first industrial entity appeared in 1949. The first was the Pennsalt Chemical Corp., one of the U. S.'s oldest basic chemical producers, which built a modest $2 million hydrofluoric plant on a ridge overlooking the river. Shortly after, Pittsburgh Metallurgical Co. built an electric-furnace alloy plant on another highland site 2 miles from town, and the germ of industrial development was spawned.

What physically drew these industries to Calvert City was a cluster of natural resources and a network of rivers and rails. Across the river lay fluorspar deposits for Pennsalt's needs. Through the area ran two Texas Gas Transmission Co. pipelines with natural gas for industrial and chemical processes. Up the rivers, cheaply by barge, came coal, salt, and other raw materials. And all around was a supply of hardy labor, some partially skilled from wartime construction, some fresh off the farm. But the big magnet to industry was nearby Kentucky Dam, a 160,000-kilowatt hydroelectric unit in the TVA complex, completed during World War II, with cheap power to turn labor and materials to use.

None of Calvert City's development would have come about, however, without a small, determined band of citizens who had worked hard and long, since World War I, to get the dam built, the roads paved, and the industrial prospects canvassed. Leader of this group was leathery, old Luther Draffen, who with his brother ran the general store, the commercial hub of Calvert City, and who for nearly two decades haunted the lobbies of the state legislature and of Congress, pressing for hydroelectric power. For a country storekeeper, Luther Draffen had a curiously modern and hard-to-explain dream of a great metropolitan economy, fed by such power, building on the washed-out tobacco lands—a dream which may account as much for the town's current troubles as for its progress. With a selflessness that even his townsmen still cannot understand, he spent more time scheming to bring the new century to Calvert City than in figuring how he might profit from it.

When, in 1951, the big Air Reduction Co. announced the building of an $8 million calcium carbide and acetylene plant on the river bank near Pittsburgh Met, things began to hum. Airco had been one of the many companies Draffen had per-

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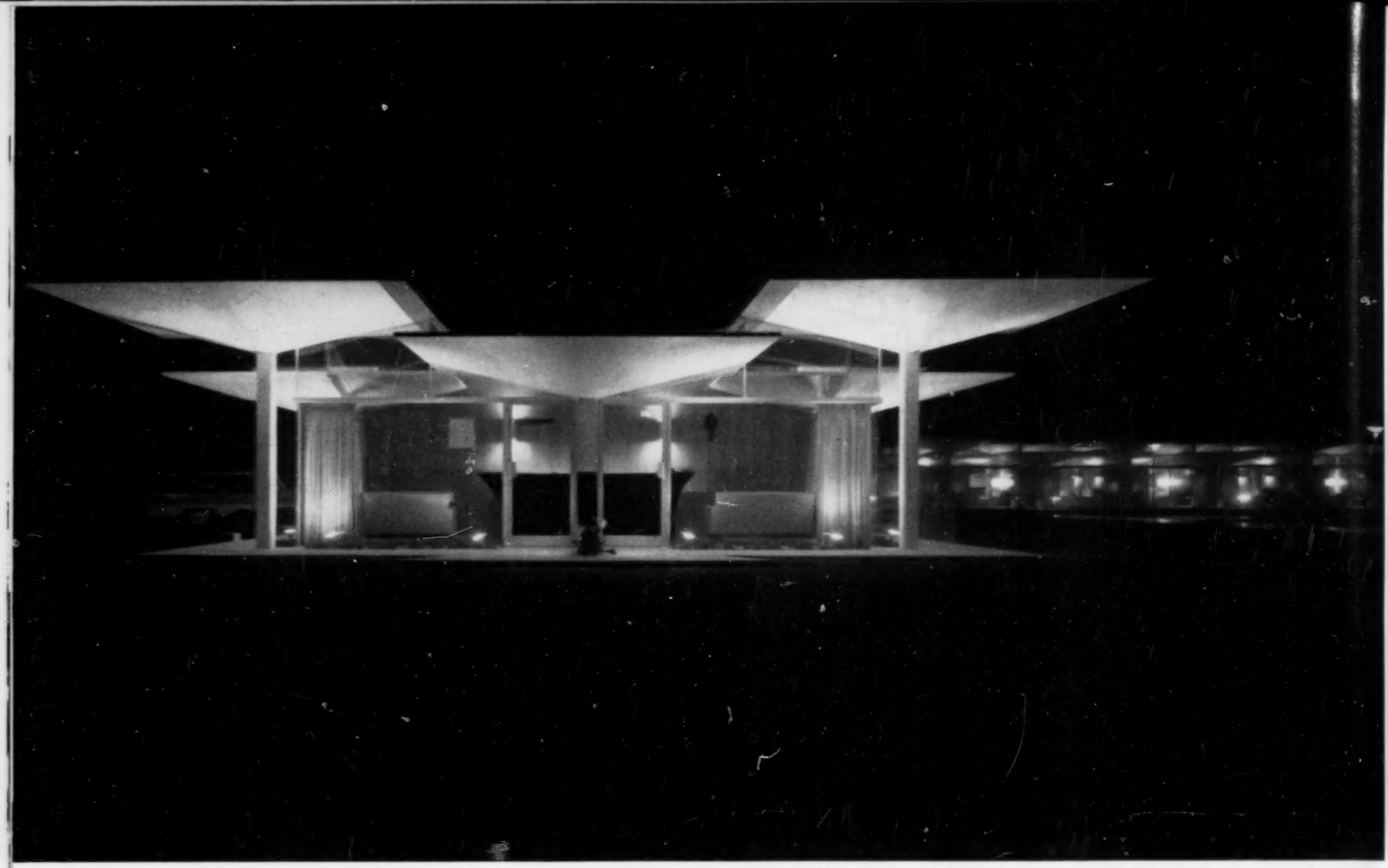
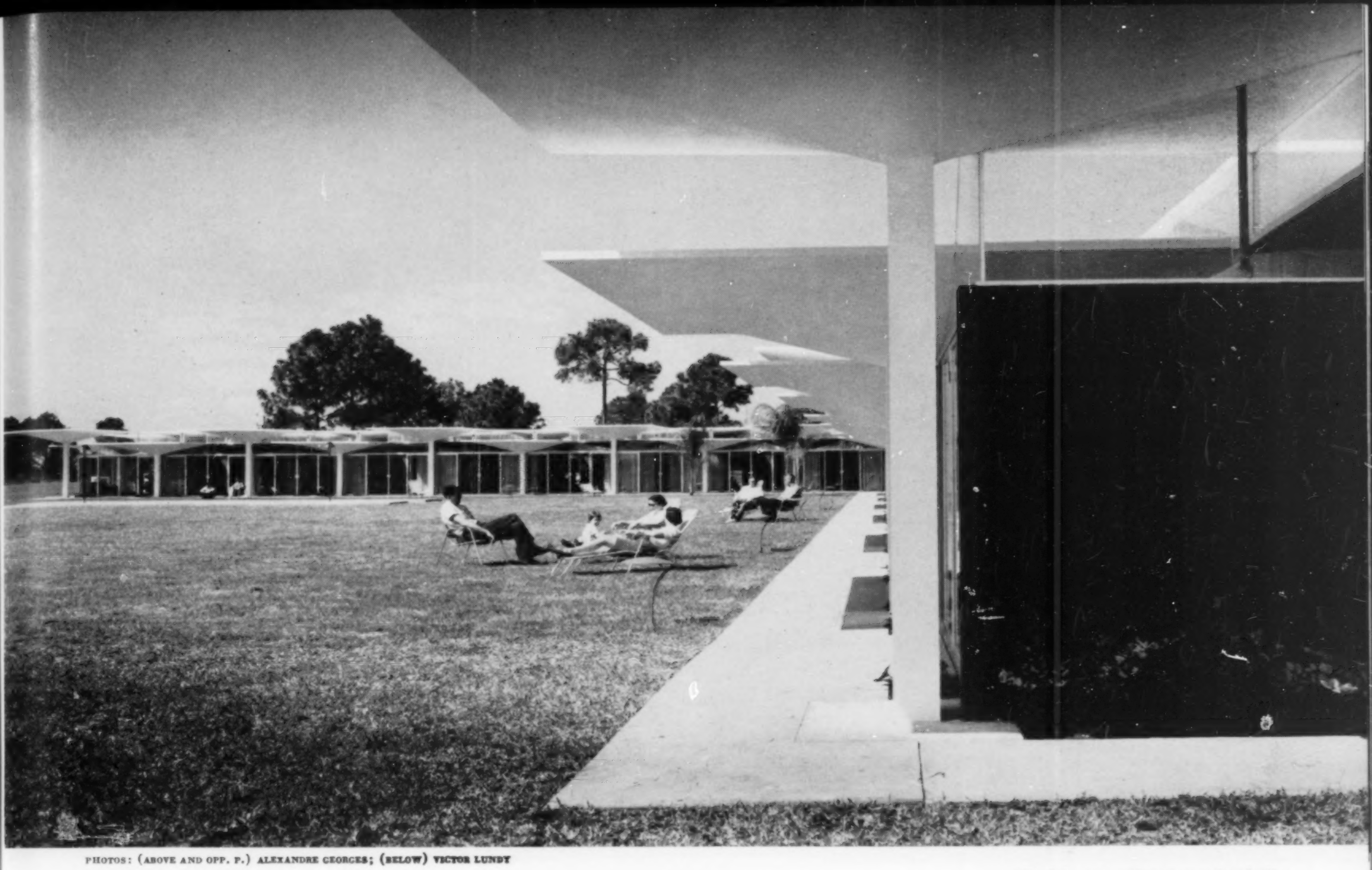


# Florida's parasol motel

An exuberant display of concrete umbrellas lures Miami-bound motorists to a roadside "fountain of youth."

One of the freshest architectural arrangements to brighten the U.S. roadside scene this spring is a small, parasol-roofed motel on the west coast of Florida. It was built by a young architect, a small contractor, and, for the most part, by unskilled labor.

To lure traffic speeding down the Tamiami Trail from Sarasota to Miami, 35-year-old Architect Victor Lundy took his cue from the watering place the motel will serve—a spa that claims to be Ponce de Leon's long-sought fountain of youth. Lundy's "fountain" motif for his Warm Mineral Springs Inn reminds some people of a mushroom, some of a Martini glass. Basically it is a small concrete shell in the shape of a



PHOTOS: (ABOVE AND OPP. P.) ALEXANDRE GEORGES; (BELOW) VICTOR LUNDY

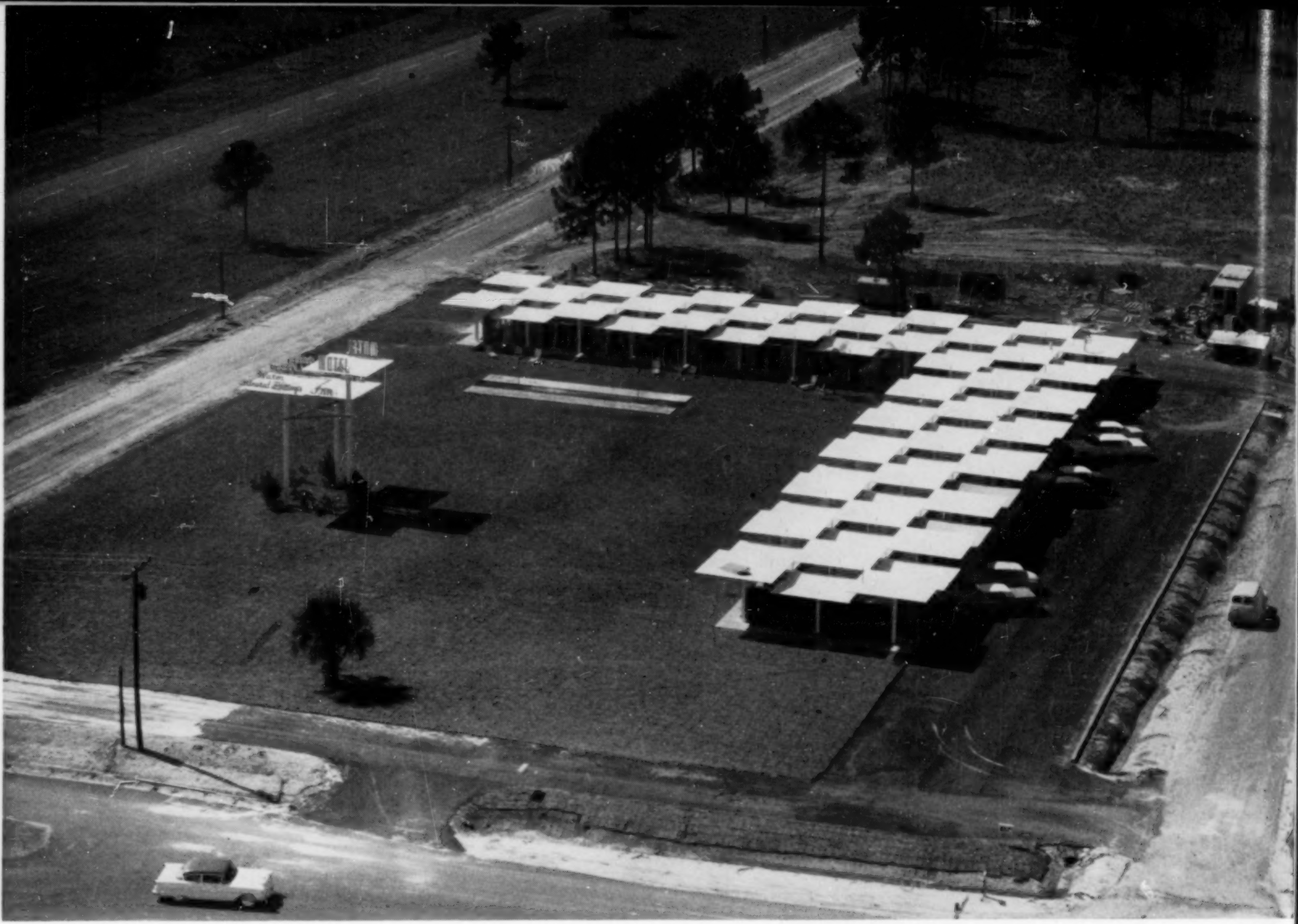
**Night vs. day:** roof shells over the motel office (far left) are lighted from below in a flying, fountainlike display visible from the road. By day, guests bask on the front lawn (above) outside glass-fronted rooms shaded by the shells, which stand out crisply white against the blue Florida sky.

hyperbolic paraboloid 14 feet 5 inches square, set on a precast concrete stem. In checkerboard fashion, this small shell is repeated 75 times above 19 studio guest rooms (above) and a front office and owner's living quarters (shown in the striking night view opposite). Alternate units in the pattern are dropped 2 feet, giving the rooms a lively pattern of clerestory lighting, and the exterior a two-level roof line. For the motel's sign out front, three more shells were hoisted atop 20 to 30 foot stalks, forming a cluster of white "palm trees" against the Florida sky (photo, page 116).

When the motel's small forest of shells-on-stems was nearing completion, nonstructural walls were erected underneath the shells, and strips of clear plastic were set on top to bridge the vertical gaps, permitting the shells to "float" as freestanding structural shapes. Construction cost, surprisingly, came to less than $160,000. Eventually, 36 more shells over 11 more guest units will round out the motel's "L" shape into a "U."

Says enthusiastic Architect Lundy, who plans to paint a small mural for each guest room to finish off the job: "Of course engineers like Candela have built this kind of shell before. But it is still an exciting experience, with only a bunch of 'country boys' and a homemade rig, to trowel in concrete and come up with a beautiful shape."

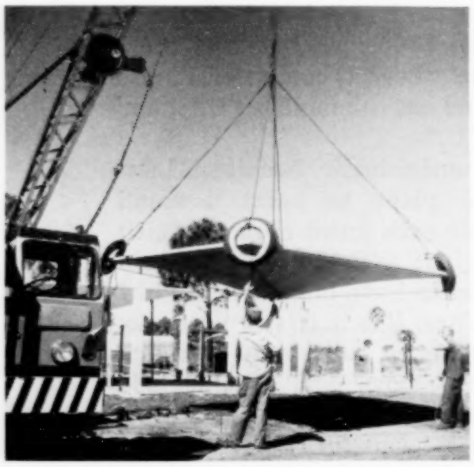
**Cars park** behind motel where room entrances and baths are screened by walls of concrete brick in an upended pattern. Shells offer sun protection.



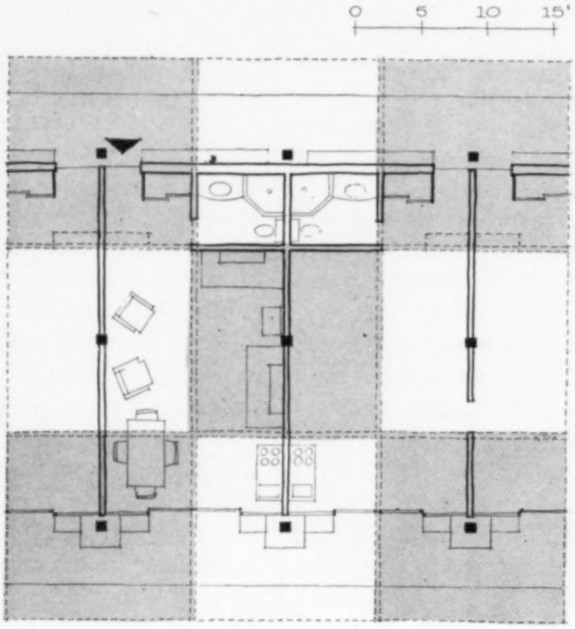
CONTINENTAL AIR VIEWS INC.

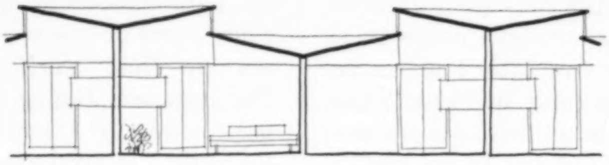
**Checkerboard roof** pattern shows clearly from the air. Near twin shuffleboard courts in front, three higher shells form a sign cluster. Lawn in foreground leaves space for a third guest wing.

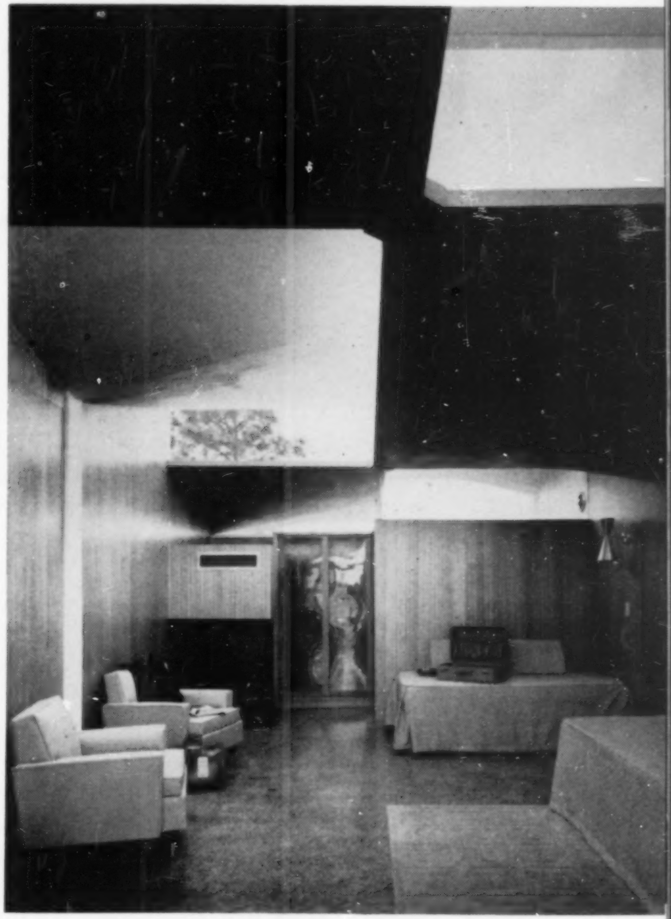
**Shells** were cast at the site, while prestressed columns were anchored to footings and braced in place by the poured floor slab. Then the 2-ton, 2-inch-thick shells were lifted by hooks welded to steel collars cast into their centers (below), steadied by lines tied to old auto tires cradling the corners, and set over the perforated tips of drainpipes cast into the columns. The collars were then welded to the steel column caps, and the shells waterproofed with plastic.



WARM MINERAL SPRINGS INN, Venice, Florida
ARCHITECT: Victor A. Lundy
CONSULTING ENGINEERS: Donald A. Sawyer (structural)
Louis H. V. Smith (mechanical)
Kenneth D. Brumbaugh (electrical)
GENERAL CONTRACTOR: Spear, Inc.

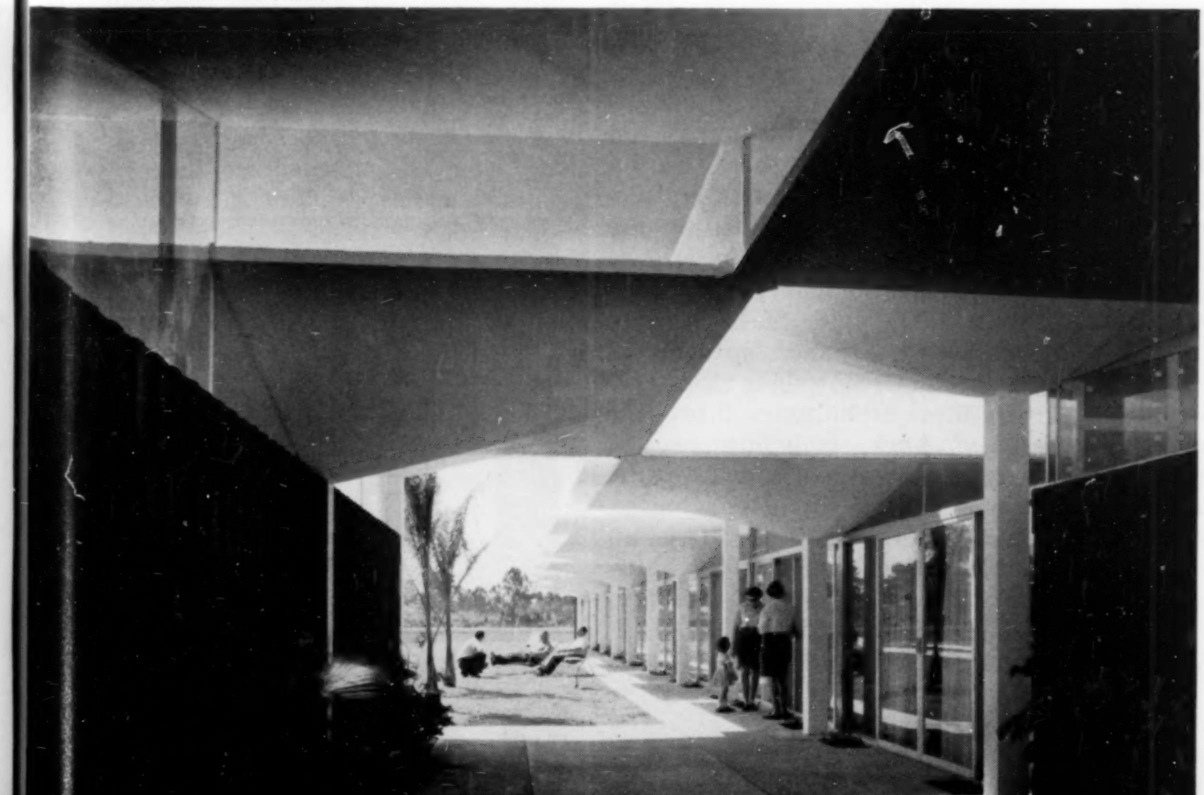






**Checkerboard ceiling** over the guest rooms contrasts low, dark shapes over entry, sleeping, and dining areas with a high, daylighted effect over bathroom, sitting, and cooking areas, where the shells are 2 feet higher. The suspended air-conditioning unit that screens the entry drips its condensate water on a plant bed set in the gray terrazzo floor. Mahogany plywood partitions between guest rooms are aligned with the columns, 14 feet apart, and are insulated to reduce noise transmission. On the lawn side (seen through the passage between wings, left) sliding glass doors and sidewalk are shielded from rain and sun by the overhanging shells.

PHOTOS: ALEXANDRE GEORGES



"The challenge is to build these buildings and make them profitable."

# City Builder Greenwald

BY DAVID CARLSON

*"The civic humanist . . . will not seek to flee the city. Rather, he will use the new age of the city to build a better civic civilization upon the foundations of the heritage which he has redeemed."*

The "civic humanist" that Ford Foundation Vice President John Osman so eloquently described in a speech last summer is a rare man. There are few such men in city government today. And there are even fewer in the business of building. Ask anyone conversant with urban problems to tick off the names of private builders who are devoting their efforts to building "a better civic civilization" through urban redevelopment, for example, and chances are he could do it on the fingers of one hand. And it is a safe bet that one of the names mentioned would be that of "Herb" Greenwald.

For Herbert S. (stands for nothing) Greenwald, Chicago builder-developer, is, at 41, a millionaire, head of a sizable construction empire with over $120 million of urban building underway and another $150 million already built, and one of the few big "redevelopers" to emerge on the U.S. building scene. Well-educated (he has a bachelor of arts degree, studied philosophy under Dr. Mortimer Adler at the University of Chicago), well-dressed to the point of being dapper, and a man of restless temperament, Greenwald is a gambler who is willing to back his ideas on "civic humanism" with cold cash. He has earned the respect, and financial backing, of some of the country's wealthiest institutions and individuals. Greenwald, in short, is turning one of the neatest tricks of the century: he is making civic humanism pay.

Greenwald spent his boyhood in St. Louis, Missouri, where he was born, and in New York City. He started building apartments in 1939 (so far he has built little else) when he was talked into investing a $25,000 inheritance in a Chicago building scheme by a man "of whom I saw little after I gave him my money." To retrieve his investment, Greenwald had to go ahead and build the apartment building, and he has been in the construction business ever since.

To date he has built over 20 apartment buildings, containing some 3,000 housing units, mostly in Chicago. He retains an equity interest in six of his apartment projects, as well as in the five Title I urban renewal projects he is building. Thus, he is both an investor and a builder. He is also one of the three leading redevelopers in the federal urban renewal program. New Yorkers William Zeckendorf of Webb & Knapp and James H. Scheuer of City & Suburban Homes Co. are the other two.

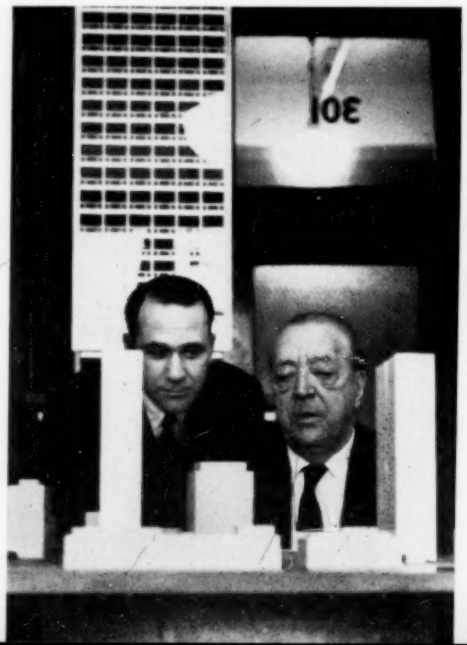
## Powerful partners

Greenwald's five urban renewal projects are in various stages of development. Farthest along is the Lafayette Park project in Detroit (FORUM, March 1957), which will contain 1,800 units of housing in both high-rise and garden-type apartments. Greenwald is also working on three urban renewal projects in New York, including two in Brooklyn near the Pratt Institute, and one at the tip of Manhattan Island, where he is building an apartment development from which "brokers will be able to walk to work." The fifth will be a $17.4 million project in Newark, New Jersey.

To do all this building, Greenwald has a sizable organization. Besides his Chicago headquarters which employs about 100 people, he has a New York office with a staff of about 50. He heads two basic companies, the Metropolitan Corp. of America and the Herbert Realty & Construction Companies, but for tax purposes he has over 50 other subsidiary corporations and trusts which handle various phases of the building and property management for the projects.

Besides this staff, Greenwald has several important allies. First, there are his financial backers, a powerful, publicity-shy group known to include some of the wealthiest investors in New York and Chicago. For instance, Henry Crown, principal owner of the Empire State Building, is reportedly an occasional Greenwald backer. Then there is Greenwald's business partner, wealthy Chicago Chevrolet dealer Samuel I. Katzin, who has worked with Greenwald since 1947, and who now devotes about 25 per cent of his time to the building business.

Most important of all to Green-



*Client and architect*

PHOTOS: (ABOVE) ROBERT PHILLIPS; (OPP. P.) FRANK SCHERSCHEL—LIFE

wald's success, however, is his association with famed, German-born Architect Ludwig Mies van der Rohe, who has been the architect for almost everything Greenwald has built. Greenwald met Mies in 1946, when he was looking for a "name" architect to design some Chicago apartments. Mies was, and still is, director of the Department of Architecture at the Illinois Institute of Technology. He had been recommended to Greenwald by a number of people—including Architect Walter Gropius. Mies recalls: "My first impression of Greenwald was that he was a charming, well-educated, and highly intelligent man. During our association since then I have found all of this to be quite true." Mies took the job Greenwald offered, and designed Chicago's now-famous Promontory apartments, which blazed the trail for the even more famous "glass apartments" that now enliven Chicago's Lake Shore Drive. Today, Mies devotes about two thirds of his working time to Greenwald projects.

Greenwald's concentration on building rental housing in the city stems from his strong feelings about the city's future. He often says such things as: "My greatest ambition is to find a solution to the housing problem, and to develop the perfect physical machine for living. In every field there has been tremendous progress—airplanes, cars, you name it. But our grandfathers lived in homes just as good as ours. Probably better because they were bigger, had more amenities. Today we just build houses, not homes." Partner Katzin adds: "The challenge is to build these buildings and make them profitable."

### "If I could write poetry . . ."

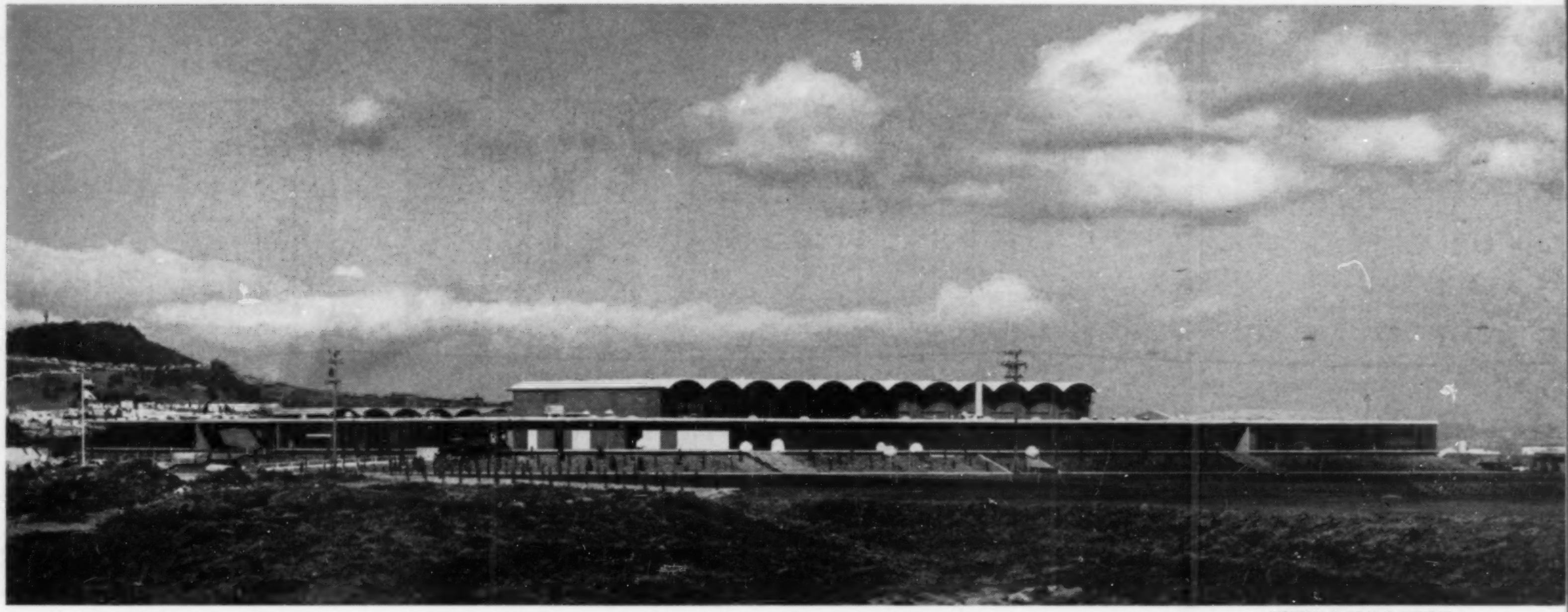
Actually, making the buildings profitable is Greenwald's specialty. Mies says: "He has the ability to go out and make others believe that these buildings can and should be built, and in that way he is able to raise the money for these buildings." And Greenwald's concession that he is "perhaps worth around $3 million," is a pretty good measure of how successful he has been in the financial end of city building.

But one of his many ambivalences is that he constantly deprecates his role as financier. "I'm not so good at making money as Zeckendorf," he contends. Yet his builder-competitors consider him a formidable business competitor, consummately skilled at the infighting of urban renewal. Last year, for instance, Greenwald wrested the Battery Park project in Manhattan away from New Yorker Zeckendorf after losing the bigger Hyde Park–Kenwood project in Chicago to Zeckendorf. Nevertheless, Greenwald says: "I would rather hang myself than think of myself as a financier." Perhaps he does not want his ability as a money manager to detract from his reputation as a cultured, urbane client of one of the world's greatest architects. He prefers the role of Renaissance prince—a sort of modern Medici.

And it is a fact that prestige

*continued on page 202*

An experiment in tight planning gives this California high school the economy and flexibility of factory construction, plus the delight of interior courts.



PHOTOS: RONDAL PARTRIDGE

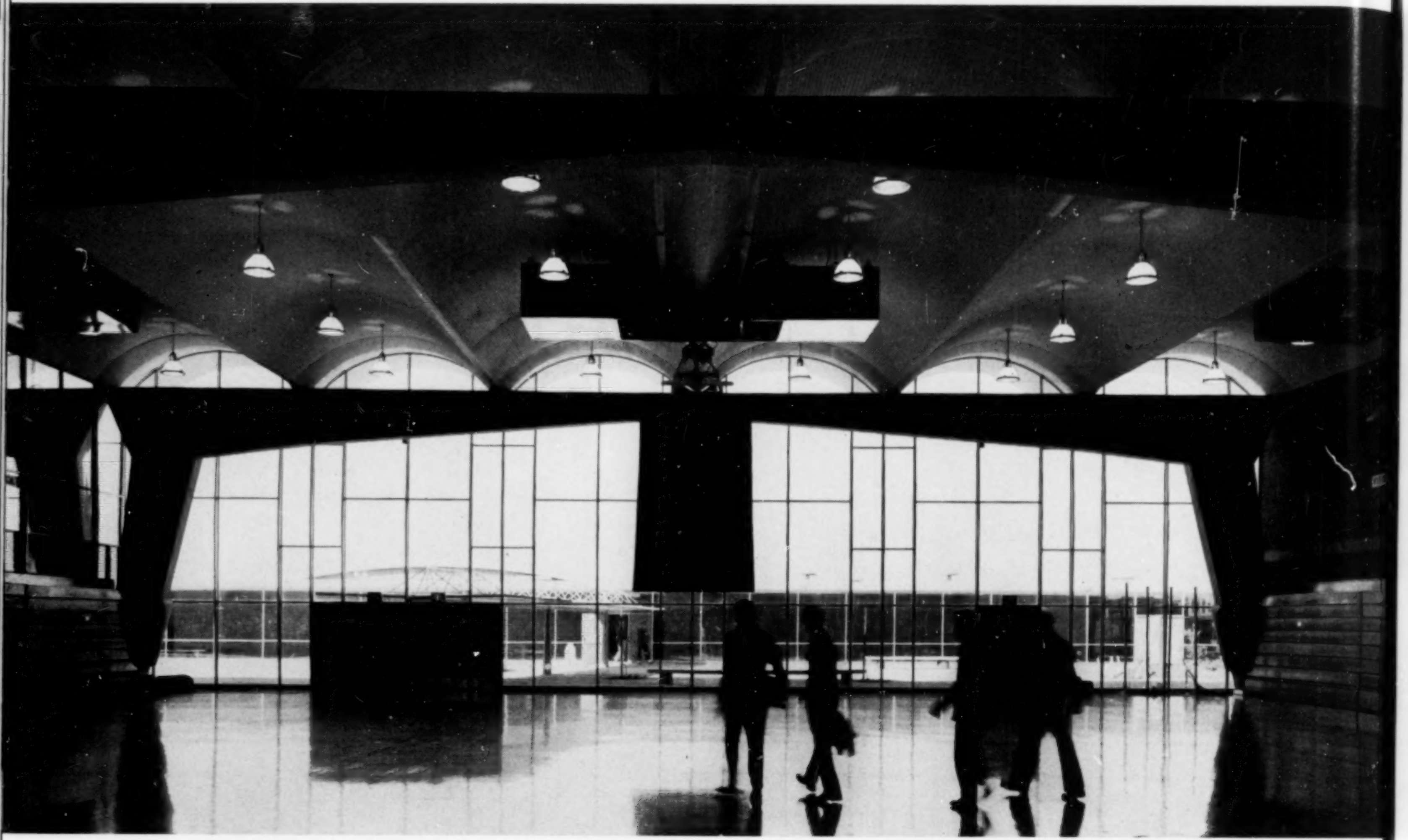
# Compactness comes back

**Vivid mural** looks down on students strolling between free-form islands of planting in Westmoor's central mall. Mounted on the glassy wall of the gymnasium, below a roof of thin concrete vaults, this 45-foot-long abstraction in porcelain enamel by Artist Anne Knorr interprets the floor patterns, hoops, balls, and animated movements of games played within. Around the outside of the school (below), under the cantilevered corridor roof, walls of heat-absorbent glass reflect another kind of mural: a tight array of pastel-colored houses typical of San Francisco's new suburbs.

The big new $3 million Westmoor High School just south of San Francisco is one of the boldest answers yet to the problem of high school design. Behind an array of shapes and colors every bit as lively as its teen-age occupants, Westmoor's classrooms and communal facilities have been enclosed in a sprawling, factorylike structure, built on economically repeated, 30-foot-square bays around a big central mall (only the barrel-vaulted gyms and shops break out of the low, flat structural formula). This compact planning not only reduced the total outside wall area to be built, heated, and maintained; it also shelters most of the school's interior space from the windy, foggy weather that frequently scuds in from the Pacific a half mile away. In an area where lights in conventional schools are turned on 90 per cent of the time anyway, Architect Mario Ciampi and his consultants substituted economical low ceilings, electric lighting (designed to be on all day), and mechanical ventilation for windows and skylights. Rooms can be darkened for movies and television at the flick of a switch.

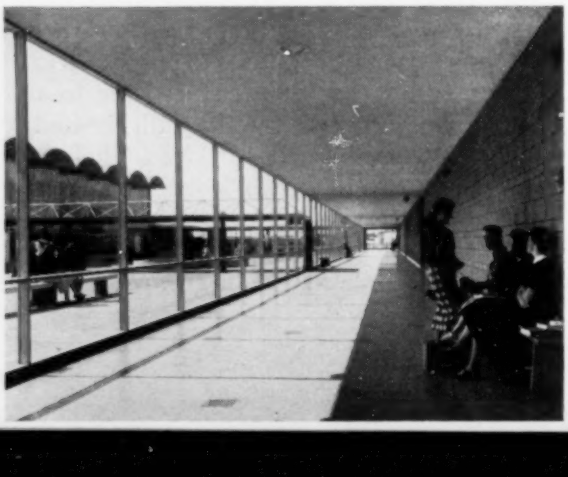
Between classes, Westmoor's 1,500 students get reacquainted with the outdoors through glass-walled perimeter corridors, in a scattering of small, landscaped courts, and in the big breathing space and meeting place—the mall.

Net cost of the school building, excluding sitework, special equipment, furnishings, and fees, came to $2,164,000—somewhat less than $15 per square foot.



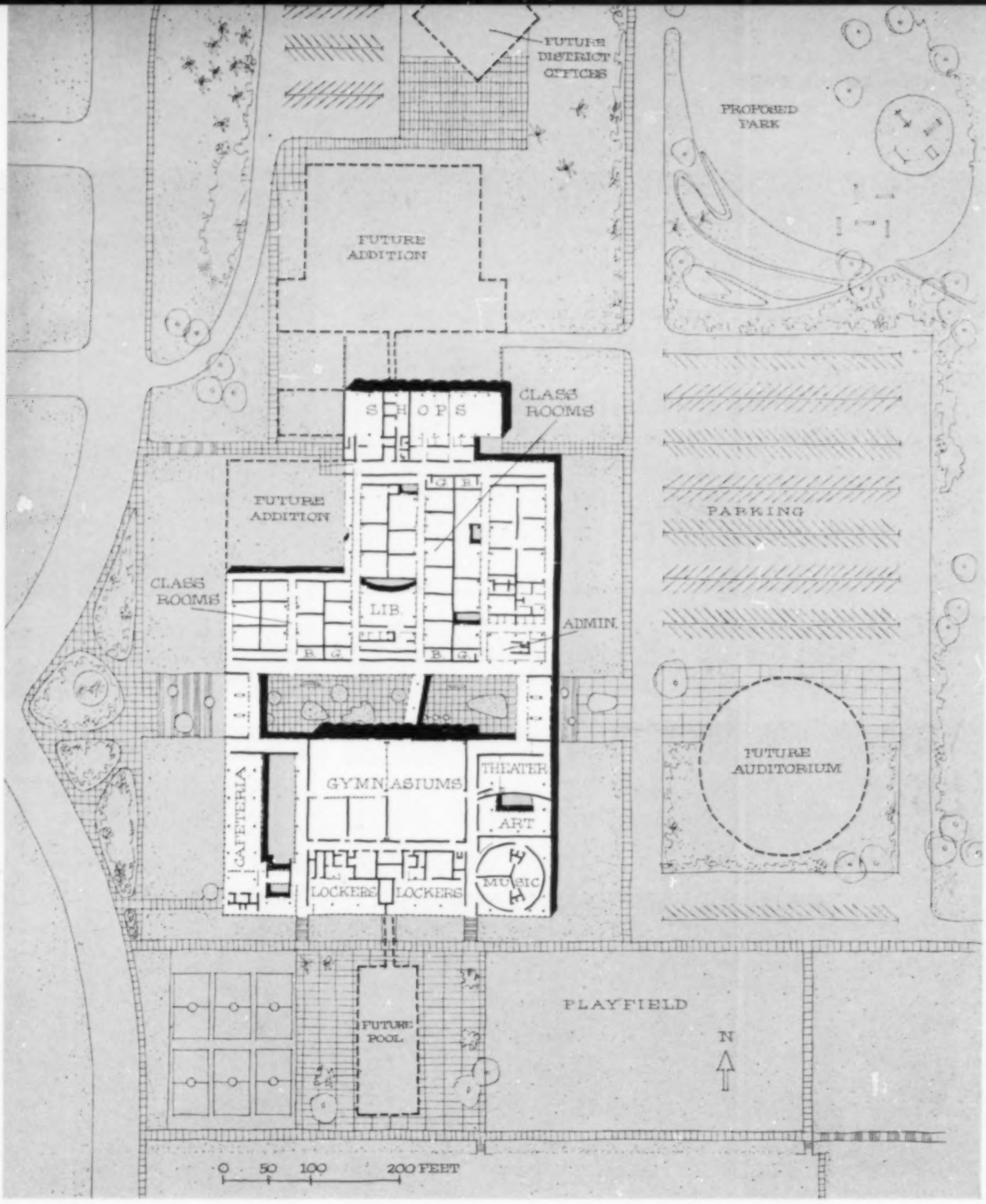
**Gymnasium** is roofed by 24 huge, precast concrete barrel vaults each 61 feet long, 15 feet wide, 3½ inches thick, and weighing nearly 20 tons. They rest on six precast concrete frames that span 90 feet each. (Only half of the big gym is shown above.)

**Students meet** in the main court or mall under a canopy connecting classrooms and gym (right). Classroom corridors feed into a broad daylighted gallery overlooking the mall (below, right). In the gym (below), tall, glass-topped partitions are shut to create smaller exercise space.

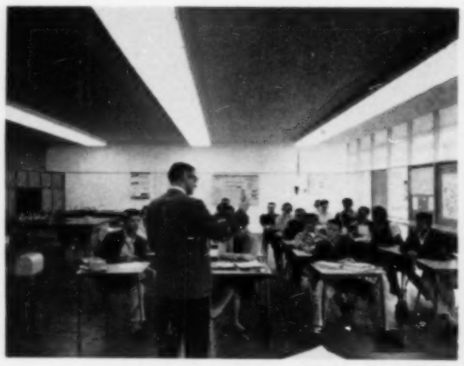


**Heart of the school** is the central mall, seen at right from just inside the main street entrance. Glass windscreens at either end shield the court from winds that blow in from the nearby Pacific Ocean.

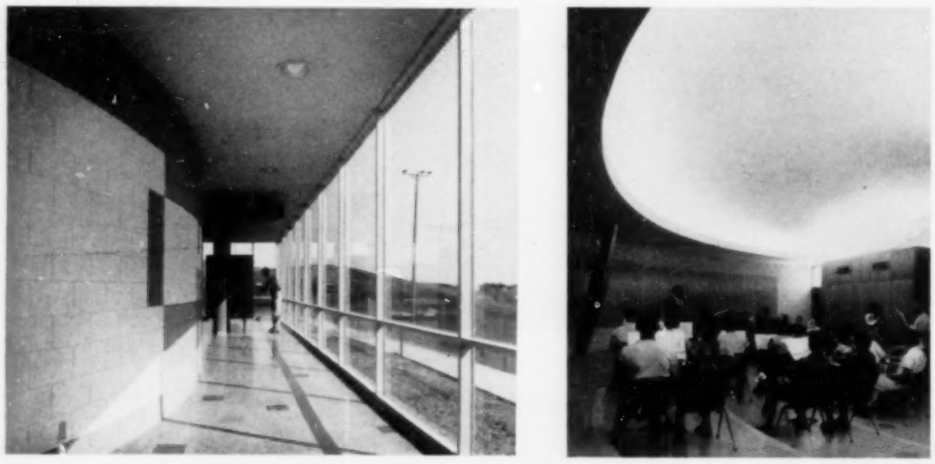
**Growth plan** shows present high school as a block of classrooms and a block of communal facilities (gym, auditorium, administrative offices, etc.) facing each other across a central mall which leads through the school from entrances at either end. This compact planning, which contrasts sharply with the open "finger plans" in vogue today, is credited with saving 2 acres of land for other use. In future stages, Westmoor will fill out the omitted corner of its present academic block, add vocational buildings and school district offices to the north, a community auditorium to the east, and a swimming pool to the south. Farther south on the 61-acre site, plans call for more playfields, a stadium, park, playground, and public library.


FUTURE DISTRICT OFFICES
PROPOSED PARK
FUTURE ADDITION
SHOPS
CLASS ROOMS
FUTURE ADDITION
PARKING
CLASS ROOMS
LIB.
ADMIN.
B G
B G
GYMNASIUMS
THEATER
ART
CAFETERIA
MUSIC
LOCKERS
LOCKERS
FUTURE AUDITORIUM
FUTURE POOL
PLAYFIELD
N
0 50 100 200 FEET

WESTMOOR HIGH SCHOOL, Daly City, California
OWNER: Jefferson Union High School District
ARCHITECT: Mario J. Ciampi; Allyn C. Martin, Paul Reiter, associates
CONSULTANT: School Planning Laboratory, Stanford University
LANDSCAPE ARCHITECT: Lawrence Halprin
ENGINEERS: Isadore Thompson (structural), Buonaccorsi & Murray (mechanical),
Harold A. Wright (electrical)
GENERAL CONTRACTOR: Theodore G. Meyer & Sons



**Windowless,** ventilated classrooms are separated from corridors by glass walls in which tackboard panels can be inserted at eye level for privacy.



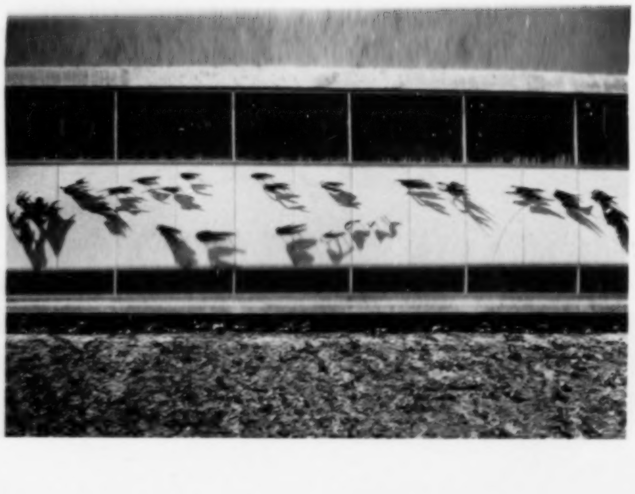
←

**Music rooms** for choir, band, and orchestra are pie-shaped segments of a big circular room topped by a thin concrete dome. Corridors around them (far left) are brightened by color designs on the concrete block wall.

→

**Classrooms** are separated from each other by soundproof partitions, from the corridor by wire safety glass. Unit ventilators draw air down from the roof, warm and distribute it to classrooms on both sides of a "core" wall (seen in background).

**Library court** at the center of the classroom block brings north light to the curving glass wall of the reading room, offers glimpses of sky and planting to corridors passing the court at either end.

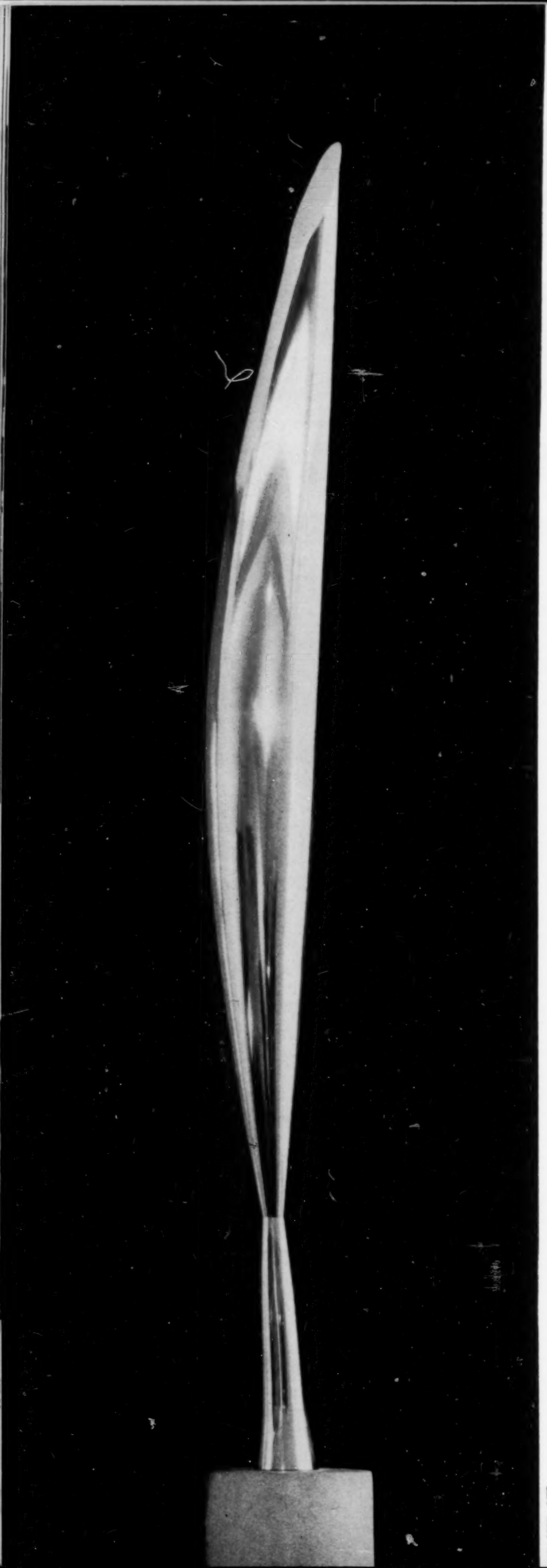


**Flight of forms** in sheet metal add to Westmoor's lively air. Sculptor Ernest Mundt took his shapes partly from marine growths and from blowing, flowering seeds.

END

# The difficult

The neat, simple face of many a modern building is achieved at considerable expense and trouble



The late Constantin Brancusi's polished bronze sculpture, "Bird in Space" (1919), remains one of the finest examples of perfection and simplicity in art.

NINA LEEN—LIFE

# art of simplicity

BY PETER BLAKE, A.I.A.

The only trouble with a simple little word like "simple" is that so many people think it is synonymous with "easy." In real life, of course, "simple" often means "difficult." Horatio Greenough, who was Emerson's sculptor-friend and one of the spiritual fathers of modern architecture, once said that "the redundant must be pared down, the superfluous dropped, the necessary itself reduced to its simplest expression. . . . This dearest of all styles costs the thought of men much, very much thought, untiring investigation, ceaseless experiment." And 100 years later Ludwig Mies van der Rohe, the leading exponent of simplicity, put the thought more tersely when he proclaimed that "less is more." He might have added, "simplicity is not for the simple."

Contrary to general belief, the modern ideal of functionalism and the modern ideal of simplicity go along together only part of the way. Functionalism is (as FORUM explained last month) basically a romantic idea; it goes back in history to Viollet-le-Duc, the contemporary of Victor Hugo and restorer of Gothic churches. To be sure, in stripping away everything that did not help the building to operate, and in reorganizing the parts of a building so they would visibly serve specific needs, the functionalists did a lot of simplifying of their own; but in the end this proved to be something very different from the ideal of a simplifier like Mies—an ideal which is basically classical. Its roots go back not so much to Viollet-le-Duc as to those great German architects of the classic revival, Von Klenze and Schinkel, who prepared the way for Mies's kind of modernism behind a Greek screen.

### Simplicity—classical and universal

The fact that the ideal of "classical simplicity" has been able to survive at all in this supercomplicated, technical age is due in part to an act of genius by Mies himself. To explain it one must go back for a moment into that many-sided, fertile, and tortured age, the nineteenth century.

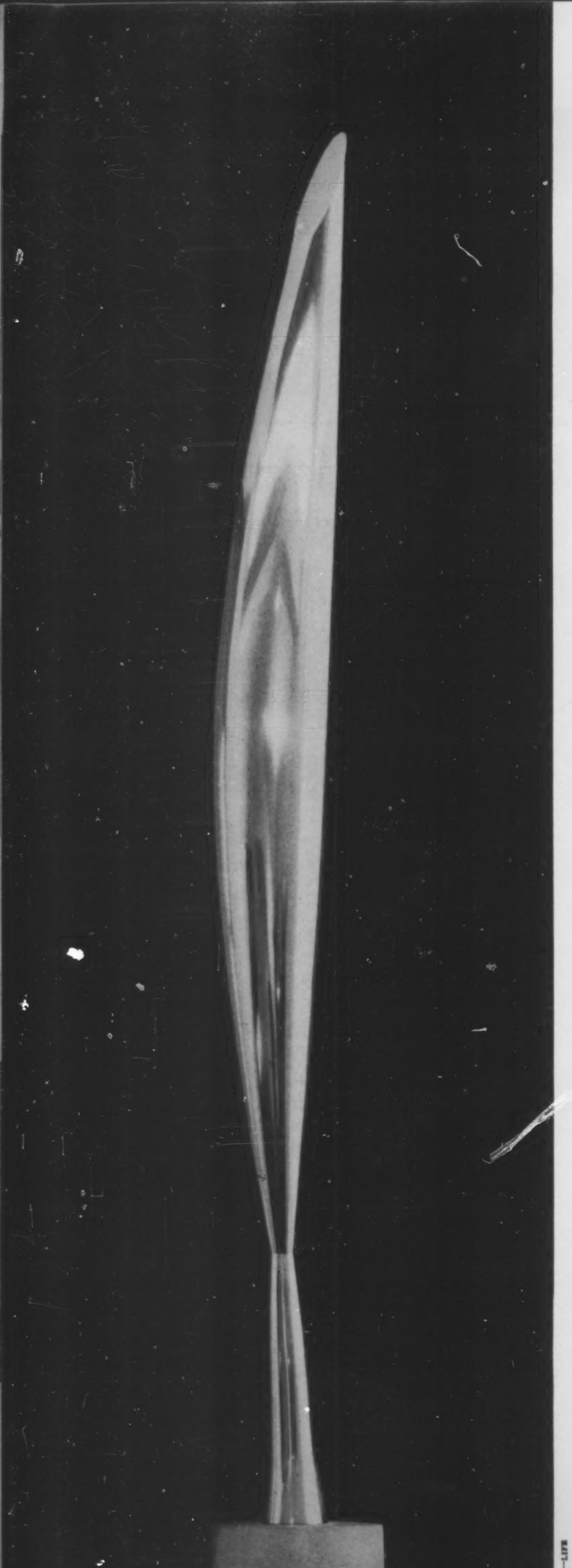
There were then three great architectural moods competing for public favor in an ever more complicated world. They are well known. There was the *classical* mood which started on a broad scale with the classical and the Greek revivals and culminated in the Lincoln Memorial. There was the *romantic* mood of the Gothic revival and of later romantic eclecticism—producing Richardson's Pittsburgh courthouse and jail, or Goodhue's St. Thomas. And then, as a steady undertone, there was the great *dramatic* surge of the Baroque, the style that lit up classical order with romantic fire—shown only weakly in America as "Georgian" architecture as, for example, in the rather imitative St. Paul's Church in New York.

These styles fought some spectacular duels, such as that between McKim's great public library in Boston across the square from Richardson's romantic Trinity Church, or between McKim's baroque Municipal Building in New York across the way from Cass Gilbert's pseudo-Gothic Woolworth Building. But all of the styles were bound to lose—at least in their nineteenth-century form; for science and technology soon demanded a very different kind of expression.

For one thing, building itself became simply too complex. Steel and concrete construction burst all the familiar masonry bounds, and mechanical equipment filled up the new buildings with a terrifying labyrinth of pipes, ducts, wires, shafts, chutes, wells, pits, docks, intakes, and exhausts. In some building types, more than 25 per cent of the enclosed space was turned over to the mechanics of living, and in a few the mechanics of living ate out the actual living space almost completely.

Worst of all, the building program itself became increasingly complicated also. Not only did new programs make a scrambled mess of those fine, stately progressions of lobbies, corridors, rotundas, and foyers that had been organized so well by the Beaux-Arts, but quick obsolescence made a hash of almost *any* predetermined sequence of spaces. More often than not, the only certainty about the future use of a building was that such use was quite uncertain—that the use might change a dozen times during the life span of the structure; so that flexibility of plan became an essential prerequisite regardless of whether an architect was designing a factory, an office building, or a three-bedroom house.

It was a situation in which—of all possible approaches—classical simplicity would have seemed to be the most certainly doomed. And so it would have been except for an act of pure genius. Yet genius itself might not have



NINA LEEN—LIFE

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MODERN ARCHITECTURE III

# The difficult

## The neat, simple face of many a modern building is achieved at considerable expense and trouble

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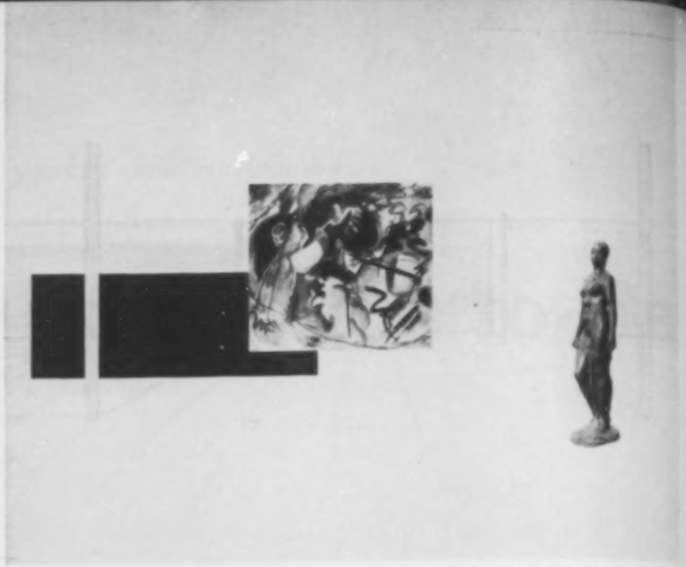
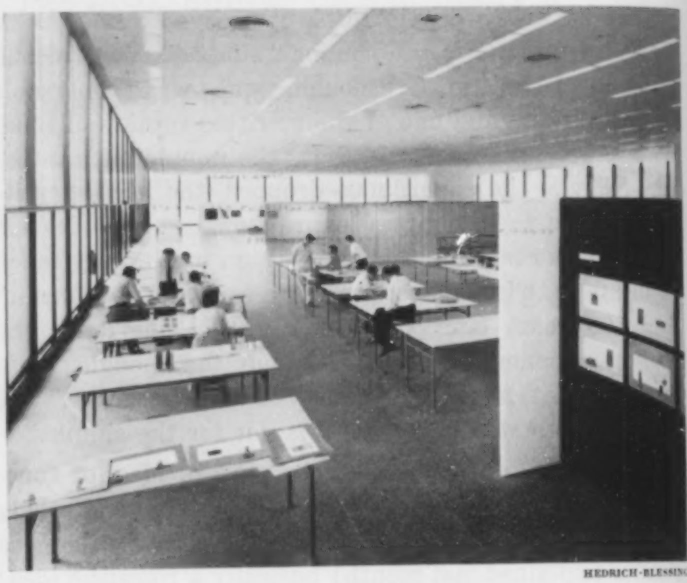
Mies's 1942 project for a small museum (top, right) dramatized his "universal space" concept by underplaying the building completely and emphasizing only its use —and the flexibility of its use. Although the museum was never built, Crown Hall at I.I.T. (bottom, right), a dozen years later, shows a similarly unobstructed, anonymous space designed to accommodate any and all possible functions.





HEDRICH-BLESSING

sufficed had there not existed, deep in the classical way of looking at building problems, a great key idea—the idea of universality.

**Mies and a universal system**

In its universality classicism went squarely against functionalism. Functionalism rested, as has been explained, upon an exact organization of particulars. For example, the particular use of one room in a school as an auditorium separated it off from other rooms in size and shape; so there it was made to stand in the functionalist plan, visible to all as "particularly" an auditorium. So, too, the gym; so, too, the classroom wing; so, too, if possible, the cafeteria and the administrative services.

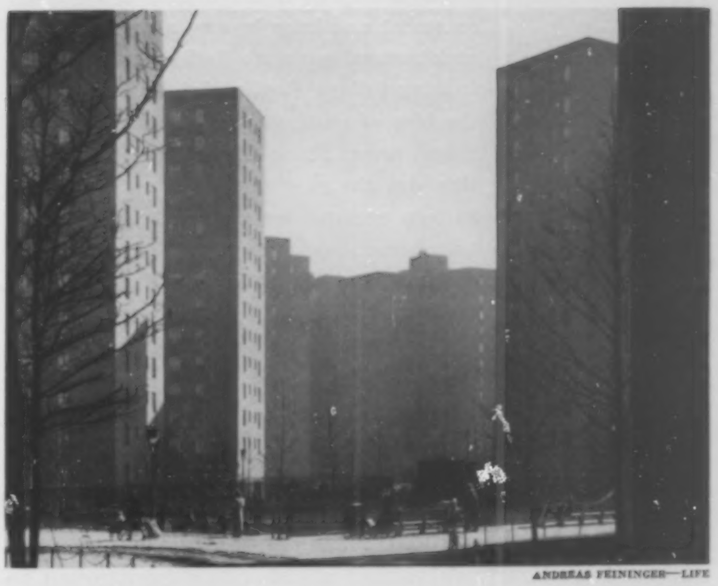
But the idea of total simplification, the classical ideal, said the opposite: if particular uses are going to change within the space we make, why then let's make a universal space that can take care of one and all possible uses! Said Mies: "We do not let the functions dictate the plan. Instead let us make room enough for *any* function."

From this basic, classical notion of a universal plan and a universal space, Mies developed an entire vocabulary of universality; a vocabulary of universal details, of universal materials (brick, steel, glass), of universal proportions. The more unpredictable building technology and building needs became, the greater was the need, in Mies's eyes, for a universal architectural system of order that could provide answers to any problem. The particular solution, to Mies, was largely a thing of the past; in a mass society with a mass technology to serve it, only universal solutions made practical sense. The particular flavor of a building would have to come from its location, from the people who used it, and from the ways they used it.

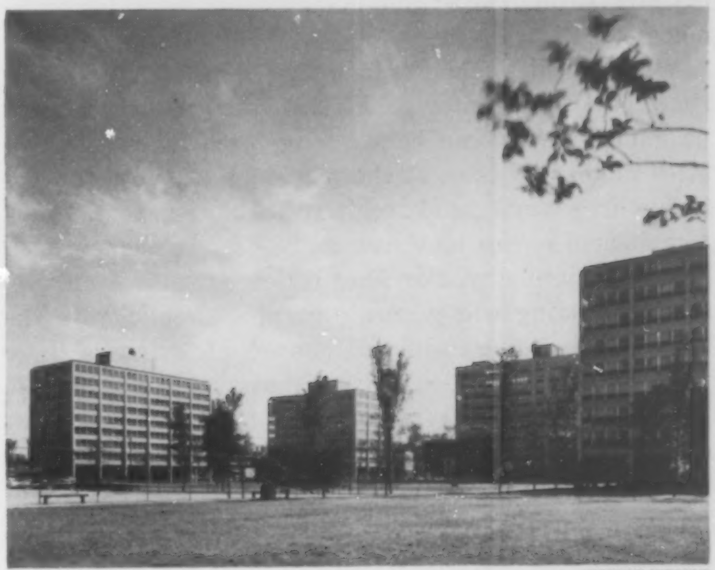
But total simplification in modern architecture as practiced by Mies did not start only as a practical alternative to functionalism or any other ism. It started as a protest against the great hanging bouquets of nineteenth-century eclecticism. And there were parallels in every field: the "Suprematist" painter, Kazimir Malevich, for example, made the most radical break possible in his particular medium when, in 1918, he painted his famous *White on White*—a white square set somewhat askew against a white background. That one wiped the slate cleaner than it had ever been wiped before; now painting was all set for a new start—the canvas became a "universal plane." And Mies tried to make a similarly radical break in 1919, with his first sketch for an all-glass skyscraper. Again, the intention was to start with a blank canvas, a clean slate. In fact, Mies suggested that the really important thing about his all-glass building was not the building itself—but the reflections in the glass! In other words, he was trying to make a building so close to nothingness, to point zero, *to universality*, that it would achieve its identity only from what went on within its walls.

Such radical breaks with the past are not uncommon; generally, however, they represent a passing phase, a point of departure. *White on White* made a certain amount of sense in 1918—at least as a slogan—but painters soon went beyond it; and the few artists today who are still aping Malevich's protest of 40 years ago are not taken very seriously by the world of modern art.

If Mies had stood still in 1919 with his basic concept of a universal space, the chances are that few critics would remember his work today. It is because Mies went beyond the first, basic concept and tried to develop an entire vocabulary of universality that he is considered so important.



ANDREAS FEININGER—LIFE



HEDRICH-BLESSING

Simplicity and simple-mindedness are by no means synonymous: typical New York housing units (top, right) are simple to the point of deadliness, conceal behind their dreary façades an allegedly "practical" plan that is full of contortions. Below, right, are Mies's faculty apartments for I.I.T.; inexpensive and simple, these buildings express dignity and order in structure and plan.

### God and the details

Mies likes to say that "God is in the Details." By this he means that a building "declares itself" through its details—features such as visible joints and trim and projection or recession—and that the details of a building are a creative force in themselves.

This points up two characteristics of architecture that are not always clearly understood: the first of these (which we mentioned in an earlier article) was most succinctly explained by Winston Churchill when he said that "we shape our buildings—and afterwards our buildings shape us." To some extent, of course, any work of art may have a similar influence; but a building has a captive audience, and a building's influence is therefore almost inescapable. Malevich's blank canvas had a very limited message. It just said: "Let's start from scratch." The simple building—the *fine,* simple building—on the other hand, seemed to say: "Let's get our house in order." And in the twentieth century, that message seemed so important to the so-called simplifiers that they were willing to make the inner structure of their buildings infinitely complicated just to get that message across.

This brings up a second characteristic that distinguishes architecture from the other arts: architecture must declare itself to be understood. This, too, is a classical notion—the use of a language of universal symbols to communicate a meaning that all can grasp, without technical preparation. A primitive example is the classical pilaster or pseudo-column, which generally supported nothing—but did give the onlooker a clear, so-to-speak poetic, idea of supports, and hence helped the building *to declare itself.*

These two notions—the idea that a building lives creatively ever after it has been built, and the idea that a building can speak only if it is permitted to declare itself—motivated simplifiers like Mies van der Rohe to stick to the straight and narrow path, even if the path turned out to be full of detours.

Anybody taking a walk on the Mies-designed campus of the Illinois Institute of Technology will find himself surrounded by two- and three-story-high buildings constructed of very simple-looking steel frames that are visible on every façade. If an engineer had designed those steel frames, the chances are that they would be quite complicated in their connections, that the steel sizes would vary depending upon the actual loads supported, and that the total effect would be clumsy and a little cheap. Inserted in I.I.T.'s neat steel frames the visitor will see precise panels of brickwork and tight-fitting units of glass. Perhaps he will, at first, find the campus a little monotonous; but with time he may discover some very subtle variations in detail—and he may *become conscious of an over-all concept of order that* spells unity and design.

He may not realize that some of the buildings he has seen—and all the steel-and-glass skyscrapers farther downtown—are not really supported by the visible, exposed steel at all; that the real supporting frame is concealed and jacketed in concrete. But even if he did know this, it is unlikely that the knowledge would detract much from the effect of serene simplicity that he had experienced. Architect Paul Rudolph put it this way recently: "Mies's cage is . . . criticized widely for exposing nonstructural steel members outside the con-

An idea may be declared first in applied ornament and later become a profound architectural concept: Sullivan's intertwining foliage (top, right) first suggested the idea of continuity in structure and space; later, Frank Lloyd Wright made this idea the most important reality in modern architecture by building continuous structures and spaces like the spiral-shaped Morris Store in San Francisco (below, right), and the Guggenheim Museum now going up in Manhattan.

JOHN SZARKOWSKI

MAYNARD L. PARKER

crete-covered steel frame. This is the long way home, but still it has produced the most eloquent steel cage known. The important point is that technology has not caught up [with design] . . . [Mies] needed a spray with a four-hour fire rating which could be applied to his structural frame; but he could not wait for technology. . . ."

Why did Mies take the long way home if there was a short cut? The visitor to I.I.T. might answer that apparent simplicity can be a strong force for order; and Mies might add that, at the present time, with technology a little way behind architectural theory, some fairly complicated means may have to be used to achieve such apparent simplicity. For Mies believes that a seemingly simple building will generate greater simplicity in the life of the building itself and, hence, in the lives of those who use it; and he also believes that a seemingly simple structure—a structure that shows how elegant simplicity can be—might direct the building industry toward the production of components and the development of methods that may, some day, make simplicity of structure and structural expression a unified, practical reality rather than an applied ornamental device.

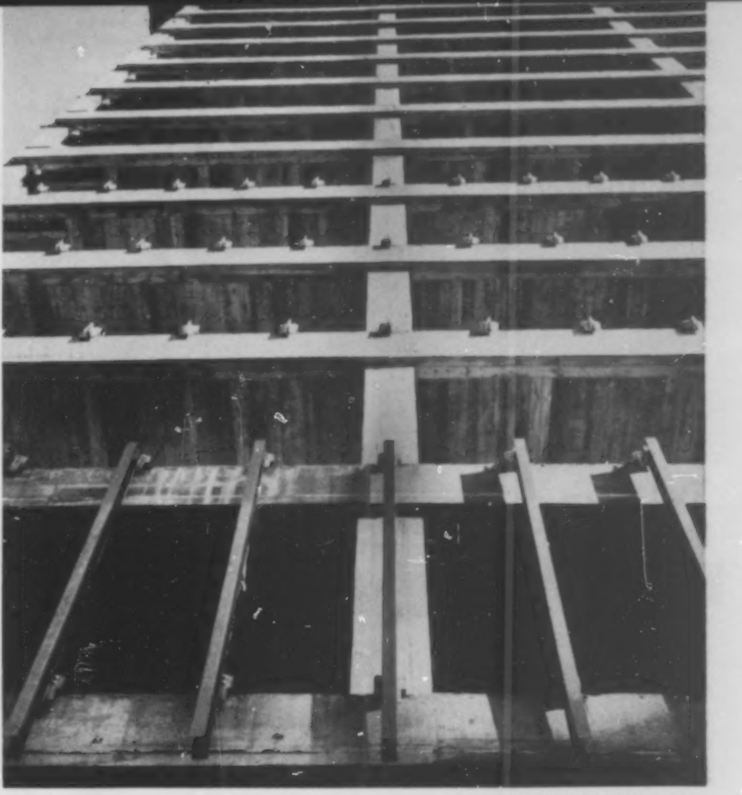
If this seems devious, it is well to remember that others have used a similar approach in the past, and with success. Louis Sullivan, for example, first stated the great principle of structural and spatial continuity in his applied ornament. Those patterns of continuously intertwining foliage were no more than intuitive sketches that suggested an idea. The idea was taken up by Sullivan's great "apprentice," Frank Lloyd Wright, and turned into a new kind of architecture altogether. But even Wright could not really build the way he knew people would soon be able to build because of the technological time-lag; only quite recently have his continuous structures been built by truly continuous means.

What do Mies's details declare? Above all, as we have seen, they declare the cage and the way it is—or should and could be—put together. Beyond this, Mies's details help declare the identity of the building: his closely spaced vertical mullions declare the soaring skyscraper; his widely spaced, long-span trusses on heavy stanchions declare a building of great, uninterrupted open spaces; and his neat, glassy volumes held up clamped between outside columns as if by magnetism declare modern architecture's conquest of gravity. The fact that all these declarations are arrived at by way of complicated (and often hidden) structural connections does not make them less impressive—as declarations of an ideal.

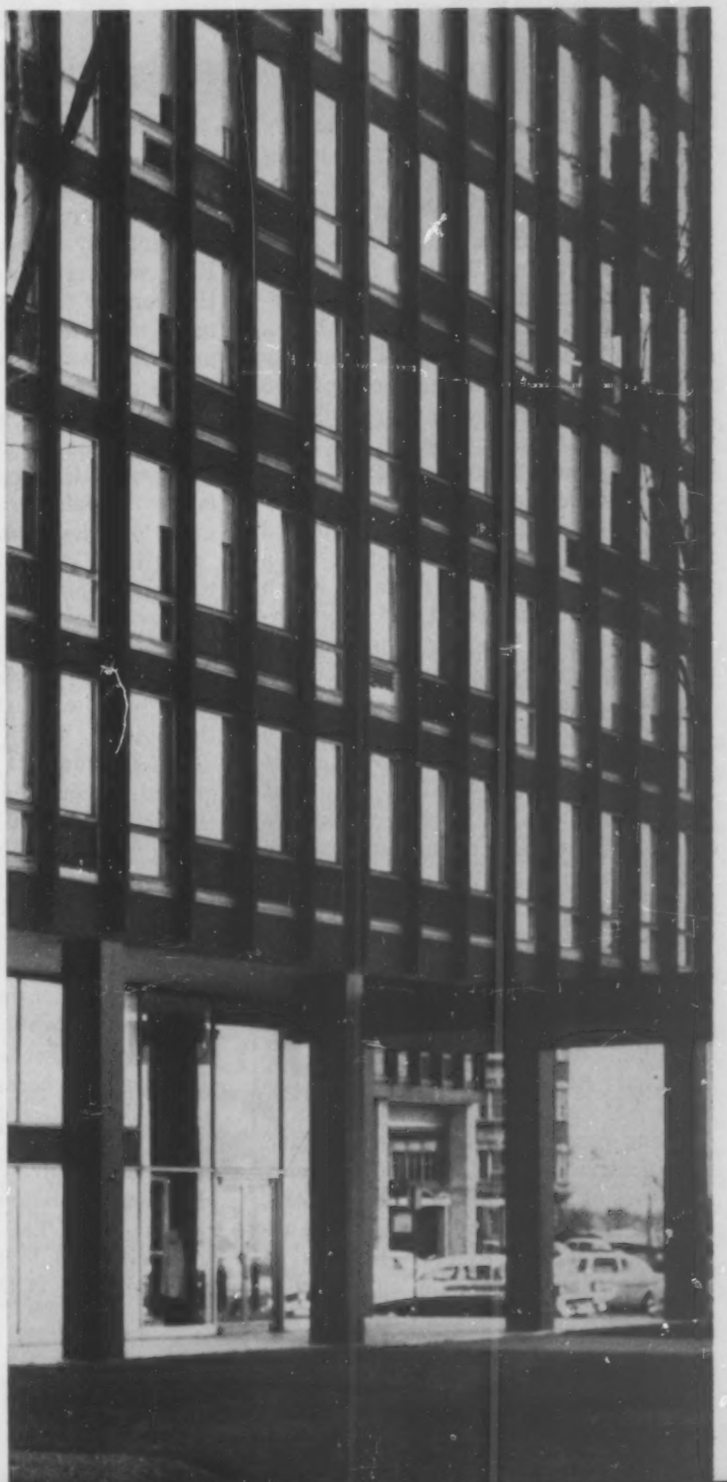
### Simplicity or oversimplification?

In Mies's arsenal of architectural solutions there is one large and, as yet, unclosed gap: to many critics it has seemed that Mies is being eloquent about the steel cage at the expense of making the space within that cage work properly in terms of mechanical equipment and indoor climate. Mies has tried to answer his critics by saying, brusquely, that "this is not my specialty"; yet, to most laymen, these problems are certainly part of the architect's responsibility.

Some of the best-known partisans of Miesian simplicity have tried to come to grips with these problems: the problem of how to heat and cool an all-glass building, how to control glare, how to make glass-walled offices efficient. They have been forced to face these facts of life through bitter experience: unprotected glass walls may be exquisitely beautiful—but if those who live and work behind them roast, they will not be around for long to enjoy the beauty; the "captive audience" of architecture



PHOTOS: FRANK SCHERSCHEL—LIFE



The idea of a steel cage, vertically accented to express the drama of the skyscraper, is boldly declared in metal rails applied to a run-of-the-mill bay structure as in this photo (top, right) of bronze rails being attached to New York's new Seagram Tower. The picture below, right, shows the final effect on a similar building in Chicago. As a declaration of a structural idea the effect is convincing in its simplicity—although it was quite difficult to achieve.

is not all *that* captive. And exquisite beauty has a way of being elusive when the glass walls are backed up by improvised brown paper shades Scotch-taped to the insides by sizzling and blinded humanity. . . . Perhaps technology will again come to the rescue in the end—but that end is not yet in sight. For the present, at least, the architect must be the one to come to the rescue.

### A universal architecture

So these are the basic tenets of universal architecture today: the concept of universal spaces rather than form-fitting (and, hence, rapidly obsolescing) building types; and the concept of universal details and materials rather than special details and special solutions.

A good case can be made (and often is made) against both of these concepts: is not rapid obsolescence the lifeblood of our building industry? Do not universal details and materials produce monotony? Some of these questions are faced by other schools of modern architecture and will be discussed in subsequent articles.

Meanwhile, the importance of the school of simplification lies in a single, inescapable fact: in the next ten years, the U.S. may double its present inventory of buildings. Only a tiny fraction of this cubage will be designed by architects of the stature of Wright or Mies.

So one of the crucial problems faced by modern architecture is to develop *systems of design* that can be copied with relative ease by lesser mortals. Nobody turned out to be very good at copying Michelangelo, and no one has turned out—so far—to be very good at copying Frank Lloyd Wright. The importance of Mies's school of simplification is that it *is* relatively easy to copy: any architect of discrimination who has absorbed the rigorous ground rules can produce a good "Mies building" and, of course, many have. Some have even gone beyond to tackle the unfinished business of indoor climate.

Perhaps it is not a very flattering commentary on our time to suggest that there is less opportunity for individual genius and inventiveness today than there used to be. Still, it is almost as hard to develop good, universal *systems* of architecture as it is to develop great individual artists. That is why Mies's system of simplicity and universality is one of the most important resources architecture can claim today.

**Basic research in the building industry is almost nonexistent. Here is a suggestion for building up the needed research funds quickly—and painlessly.**

# Needed: a building science

BY DAVID ALLISON

The $48 billion building industry probably spends less for scientific research than any other major industry in the U.S. The best figure for the total amount of building research that any estimator can come up with is a mere $250 million a year, or only about one-half of one per cent of total building volume. This hardly compares with such other major industries as chemicals and electrical equipment, which regularly invest some 3 per cent of sales in research and development.

Moreover, fully 95 per cent of building research is on manufactured products and materials. Indeed, if it were not for the manufacturers, building research would vanish to nothing but a series of scattered islands of activity in a handful of universities, one or two government agencies, one or two private foundations, and—here and there—in the offices of a few dedicated architects and engineers. For the least research is being done where it is needed most, in studying the building as a whole. Furthermore, the research which gets done is so scattered and uncoordinated that there is nothing approaching a building science in the U.S. today.

Within the building industry, there is a determined effort under way to bring more science to the practice of building, from the earliest stages of architectural design to the final stages of construction. One organization which has taken on a part of this responsibility is the Building Research Institute, the industry's privately financed technical society, which was set up in 1952 "to aid the progress of research and the development of technology in building." Actually, BRI, a unit of the National Academy of Sciences, has never before engaged in or sponsored building research, despite its name and its objective. Instead, it has acted only as a sort of town hall for the industry, staging periodic conferences on subjects of general interest—plastics in building, illumination, the curtain wall—for its 1,100 members. In its newest effort, that of stimulating a national program of research, BRI is looking toward establishment of a true building science, whose coordinated parts are shown in the diagram opposite and discussed on p. 206.

## Art versus science?

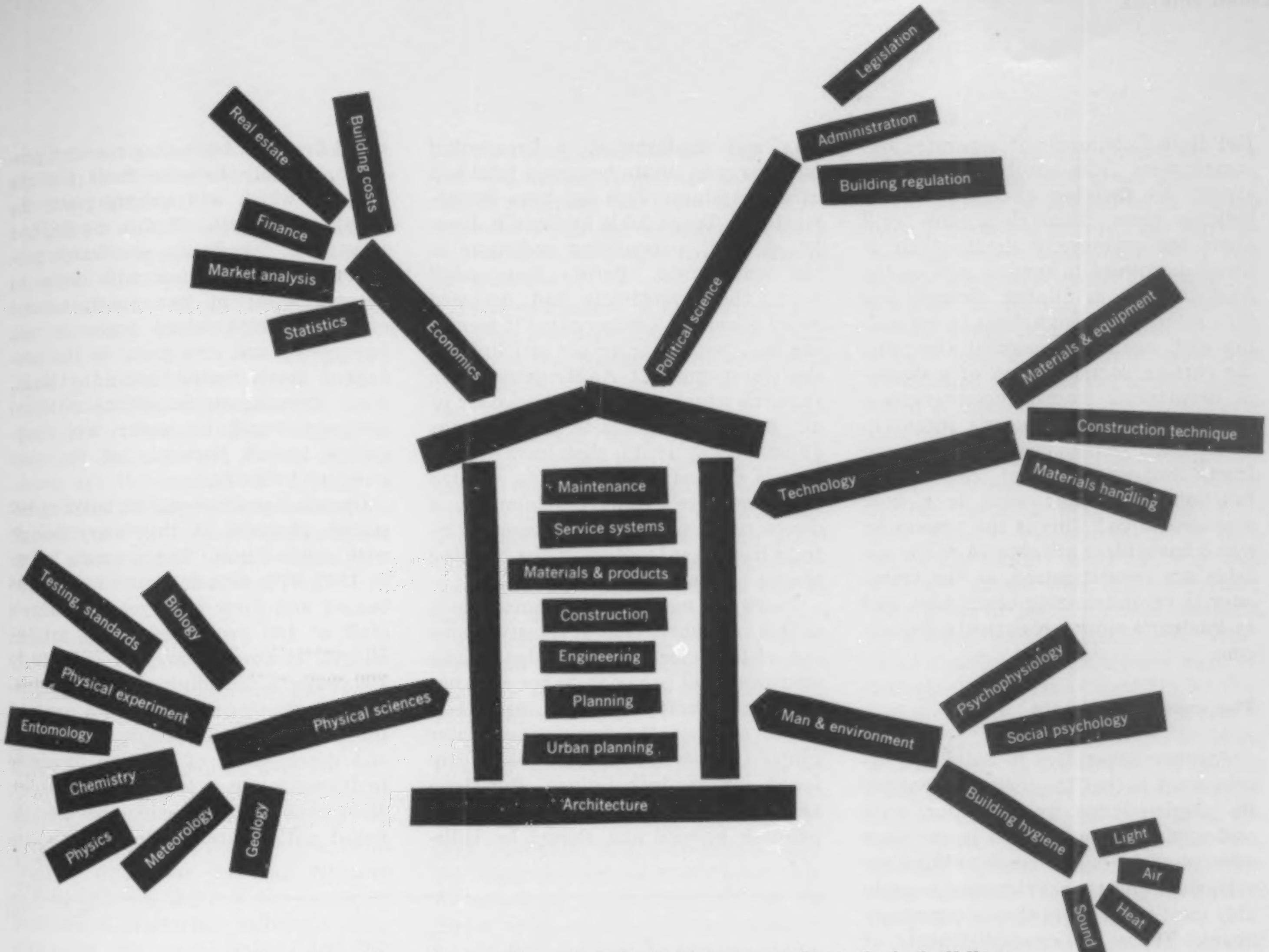
While there is general agreement within the building industry that research is *good*—"the popular religion," one ironic architect calls it—there is as yet virtually no agreement, even among BRI members, as to the meaning of the word or the nature of problems that most need investigating. Research on products or materials is easy enough to define and to see, for it is applied research aimed toward very practical ends, such as a nonleak sealant for curtain walls. One research director of a large building enterprise describes much of what goes on in this area as "a witches'-caldron-type of puttering in which a pinch of this has been added to a gallon of that, so that someone can make homogenized birdseed look like ceramic tile." This article will not be much occupied with applied research in the building field.

But beyond this is a very large area of truly basic research, hard to define, stretching toward the basic sciences, which the building industry has never thought much about in any comprehensive way. The difference between this and applied research was perhaps best expressed several years ago by a prominent U.S. scientist. He said that for $2 billion he would take on the job of building a rocket to carry an expedition to the moon, because all the technical details were known. But he would not quote a figure on developing a theory as to why the drawing of wire alters its electrical resistance according to no known laws. The moon rocket, in a sense, is akin to building product development; it is the application of existing knowledge and its results are fairly predictable. The wire theory is basic research, which will not be solved by money alone. The scientist said that the right man, with a slide rule and a piece of wire, might get an answer for 50 cents. But $20 million might go to 200 men, with no answer forthcoming.

Because so few men in the building industry have been taught to think in these terms, to make this fundamental dictinction, the Building Research Institute in its exploration of the research area has found it difficult to get people in building to suggest basic problems for research. Indeed, there are some who think that no additional research is needed at all.

Architecture and building are, in fact, at much the same stage of research development as medicine was a century ago, before Louis Pasteur established the germ theory of disease. Medicine then, like architecture, was an ancient art, based on a good deal of sound humanistic lore and technical crafts. Some small infiltration of the developing sciences was taking place, but medical practitioners generally believed that their traditional knowledge was somehow on a higher level than the experimental scientists', and that they had nothing to learn from the likes of chemists and biologists. Thus when Pasteur, a mere chemist studying fermentation for the wine industry, showed that contagious diseases were caused by microscopic organisms, it took a long battle to get medical men to accept the fact that for centuries they had been killing people with dirty scalpels and ignorance of the cause and cure of diseases.

Today, many architects still regard as heresy the thesis that what their art needs is more science. But here their traditional defender, the American Institute of Architects, is in the enemy camp. Says the AIA: "The architect has for too long left research and inventiveness to others—the engineer and


Real estate
Building costs
Finance
Market analysis
Statistics
Economics
Political science
Legislation
Administration
Building regulation
Materials & equipment
Construction technique
Materials handling
Technology
Maintenance
Service systems
Materials & products
Construction
Engineering
Planning
Urban planning
Architecture
Testing, standards
Biology
Physical experiment
Entomology
Chemistry
Physics
Meteorology
Geology
Physical sciences
Man & environment
Psychophysiology
Social psychology
Building hygiene
Light
Air
Heat
Sound

**Five areas of basic research contribute to the seven elements in building**

A true building science must include these coordinated parts and each must grow in the total development of the science. To date, the building industry has put virtually all its effort on product development.

the manufacturer. . . . This failure to participate in research and development activity . . . has left the architect unprepared to use even such research data as have become available. Thus the architect is finding it more and more difficult to solve today's complex building problems."

### What does a door do?

The kind of research that building needs is research that will yield better buildings, not just better bricks, better light bulbs, or better curtain-wall panels. It is research that explores such questions as sound transmission, of which very little is known, and the principles of human environment, which are studied now by only a handful of architects, and the whole question of construction methods, which is virtually void of any research activity at all. These are fairly fundamental questions, and they must at least be investigated if the building industry is to claim to be a field which nurtures science.

In truth, however, there is a disgraceful dearth of interest in this kind of work. At the University of Michigan, a group of faculty members from 11 departments, including architecture, physiology, and social anthropology have endeavored for four years to stir up interest in a study of school environment, i.e., what kinds of space are most suited for learning, somewhat along the lines of a Ford Foundation's project, p. 206. But the Michigan group can get no money; its only hope now is that Ford or another foundation will help finance the work and that this will prompt contributions from the building industry. At Cornell University, there is an excellent research program in the housing field: Cornell's Housing Research Center, under Glenn Beyer, which was established in 1950. But even this program does not trace back to the house builders' quest for scientific information; the Cornell Agriculture Experimental Station simply decided to use part of its federal research funds to do some work to improve housing.

Instead of thinking solely in terms of how any new material can be substituted for something already in use, builders must begin to think in terms of function. An example: the door. The Greeks and Romans made perfectly good doors, and through the centuries they have been improved on. Thus, product development has evolved an impressive array of doors of wood, metal, glass, and plastic; and further tinkering has made doors that swing, slide, lift, sink, or revolve. But by what manner of tinkering and puttering could the newest of doors have evolved, for it is not a door at all but simply a curtain or closure of air? No glass manufacturer would have conceived it, because it contains no glass, and for that matter no wood, metal, or plastic, either. And no producer of traditional doors would have conceived it, because it does not behave as any traditional door does.

But it is functional: it separates one environment from another, as a door should, by wedging a curtain of air between them. Through a wide grill above the entrance, a draft of air is blown downward to another grill on the floor. The air is filtered, cleaned, and then returned through ducts in the ceiling grill again. Throughout the year, the curtain does the work of a door—in department stores, supermarkets—but without the old door's inconvenience. Such developments as this one from Switzerland must come from functional thinking: what is a door supposed to do? This is the process by which basic ideas are created and whole fields are revolutionized, as the transistor is revolutionizing electronics, and as Pasteur's work revolutionized medicine.

### The research climate

Another imperative to building's development is that the industry abandon its single-minded preoccupation with cost-cutting research. This is one more adverse effect of too much product development and its shortcoming is probably most apparent in the contemporary house. There is accomplishment, of course, when buildings can be built for less than their counterparts of a generation ago. Indeed, many of today's best new schools are built for less money than good schools of the twenties, allowing for inflation, of course. But any research program which sets out with the single objective of cutting costs of building, whether of schools, houses, churches, or jails, is likely to degenerate to nothing more than a search for cheaper substitutes for existing materials. This, in fact, may be an inherent weakness of the BRI research program, for its main objective is cost reduction.

Perhaps this is the only way to rally an unsophisticated industry behind a program of research, by proclaiming a national effort to "keep costs in line." At least, nobody will be against such a program. But it is folly to expect great ideas to spring from it. Edison did not invent the electric light through outrage at the high cost of candles, nor did the metal curtain wall stem from the high cost of bricks.

What kind of basic research should building stimulate? In the beginning, it should be modest research. With just a little effort, for example by development of a better understanding of such natural forces of environment as ventilation and daylighting, a broadening building science can become a vital tool of architecture. This has been demonstrated at Texas A&M by Caudill, Rowlett & Scott, outstanding architects in the school field. Before their A&M work, these architects had designed many schools in a finger plan; it seemed the best way to bring air and light to the classrooms. At A&M, however, in research which studied the behavior of air around the outside of buildings (FORUM, May 1951), they learned with models that air flow could be created on a structure's leeward side and as a direct result of this work, these architects have new freedom in the building shapes they can use.

There are many building areas, such as this one, where modest research sums can yield important knowledge. Some examples: soil behavior, vapor and condensation, heat and moisture flow. These are not the great, spectacular projects which are likely to create profound changes in buildings. But these are essential elements in a developing building science and should be cultivated first in a beginning research program, if only because these are the projects which will quickly prove the worth of research. Within a year, and in capable, free hands, a research program in condensation will begin to show results; in two years, several other programs would begin to look impressive and confidence in the programs' merit would begin to build. Soon enough, an important national program would be under way, supported by all segments of the vast building industry.

Canada has developed its building research program in this way, though with public funds. The program began in 1947 with nine men and a $100,000 budget and grew each year to today's staff of 150 people and a $1 million budget. It now is carrying out nearly 100 projects, including work in combustion—development of fire, and combustion of fibrous and plastic materials—and development of relative humidity instrumentation, a longer term project. More than a dozen nations have established national research programs, in-

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### A checklist of needed research

**Listed below are five research areas and five specific research projects that should be given a high priority. In some cases scattered work has already been done. But broad programs in these areas would become an invaluable source of new knowledge, new techniques, and revolutionary advances in the building art.**

BASIC RESEARCH

**THE PHYSICS OF SPACE:** An investigation of all the physical and mathematical aspects of space and space enclosure, the prime ingredient of architecture. Example: R. Buckminster Fuller's studies leading to geodesics.

**THE IMPACT OF SPACE:** A study in depth of the physical and emotional effects on people of architectural forms and space, ceiling heights, room dimensions, exterior proportions, illusions. Very little work has been done.

**THE PHYSICS OF THE EYE:** An investigation into how the eye sees, with special reference to the aspects of architecture in which the eye plays a leading role. Much unrelated research, but much remains to be known.

**THE CLIMATOLOGY OF BUILDINGS:** A broad-scale investigation of all physical and mathematical aspects of weather and atmosphere on buildings, inside and out. Good work at universities, such as Princeton, but more needed.

**THE IMPACT OF THERMAL ENVIRONMENT:** A study in depth of the physical and emotional impact on the human body of temperature, humidity, air velocity. Important work at New Haven's Pierce Foundation.

APPLIED RESEARCH

**A DOUBLE-DECK ELEVATOR:** Development of an arrangement to halve the number of elevator shafts and speed traffic in skyscrapers. Tried once without success years ago, but may now be feasible.

**AN ELECTRONIC SOUND SCREEN:** A proposal to solve acoustical problems in free space or enclosures by setting up an invisible veil of electronic impulses to act as a sound barrier. Far out in left field, but worth investigation.

**AN INTEGRAL SKIN-WALL PANEL:** Development of composite wall or window units that would incorporate facilities for heat, light, air conditioning, and mood creation, either within the prefabricated sandwich-wall structure itself or within the window glass. Panels incorporating some of these elements already exist, but a completely integrated wall structure could eliminate all separate, cumbersome service equipment.

**A MASTER ENVIRONMENTAL CONTROL:** Development of a single integrated instrument that would simultaneously measure and control four environmental elements within an enclosure — temperature, humidity, illumination, and noise. Parts of such a system are lying about, but their integration would go far to upgrade human efficiency.

**THE STATISTICS OF SITEWORK COSTS:** A comprehensive study and compilation of construction costs at the site for representative U.S. regions, to serve as a base for continuing studies of costs, savings, and productivity (see page 103). Probably the area of scantest building knowledge.

cluding comprehensive programs in Britain, the Netherlands, and the Scandinavian countries.

With an established program and a history of accomplishment, a building research organization can begin to explore such areas as combustion, as well as important, exciting fields such as human environment and human behavior. As Skidmore, Owings & Merrill's Robert W. Cutler says: "We really don't know enough about human reactions," and, after all, human requirements are the essence of building. A basic understanding of man's reactions to surrounding stimuli—temperature, noise, color, space volume—must precede a mastery of building itself.

**The connecting links**

These are the extremes of basic building research: from the tangible questions of soil behavior and vapor, which are straightforward in analysis, to the knotty problems involving human characteristics: the workings of the human eye and psyche. All constitute fruitful areas for building research and in between there is the necessary business of mastering building's gadgetry—the air conditioning, lighting, elevatoring—which usually constitute at least one-third of the cost of many structures. In this century, while architecture has busily occupied itself with establishing "professional stature" and laying down sharp lines around its ethics, these devices of technology have swarmed over building, baffling the architect with their technical complexities and relegating him— in the words of Building Consultant Henry Wright —to the equivalent of "a good panel leader in a radio discussion." Reflected in this observation is one of the most serious criticisms of modern architecture: that buildings are frequently designed in defiance of nature, and then compensated with electrical and mechanical gadgetry. Robert Newman, of Acoustical Consultants Bolt, Beranek & Newman, himself an architect, calls this defiance "the basic immorality of modern architecture," and substantiates it with a list of examples by "some of the best-known firms in the profession."

This middle ground fits rather awkwardly into the building research pattern, because it is not really basic research in the strictest sense. It might be called applications development, for what it amounts to is simply a development of the architect's ability to cope with the devices of the day. But whatever its name, it belongs in the research program, for there is no other route by which the architect can learn to master his art than first to master its elements.

In large measure, it has been the rise of these new technical elements which has sped the decline of the architect's importance. "The architect is a sculptor, an artist," says an M.I.T. structures professor, "he is taught by sculptors and painters who have no grounding in the physical realities of structures." Building's burst of technological gadgetry has helped bring about this lopsided development in architectural education; many schools feel an inability to cope with the new engineering elements, hence they either write them out of the curriculum or teach them so frothily as to deny their importance.

A new research character in building, however, might change this, because the universities would be called upon to carry out the research, and the natural focal point of a university's building research program would seem to be its school of architecture. Of all the forces which could be put upon architecture to change it for the better—to turn it toward a profession of Leonardos—the force of research promises to have the most significant and lasting effect. The lack of research activity among U. S. schools of architecture is disgraceful, with many schools conducting no research whatsoever; most of those which do are working on building product developments for the manufacturing industry. Indeed, says one of the world's outstanding structural engineers, who was educated in Europe and now teaches in one of the top U. S. architectural schools: "Research in America's schools of architecture is comic."

A number of schools, notably Michigan, Princeton, and the University of Florida, are determined to introduce a coordinated research activity to the campus, including each of the academic departments which would logically fit into an integrated building science: architecture; structural, mechanical, electrical, chemical, and the other engineering fields; the natural sciences and the social sciences.

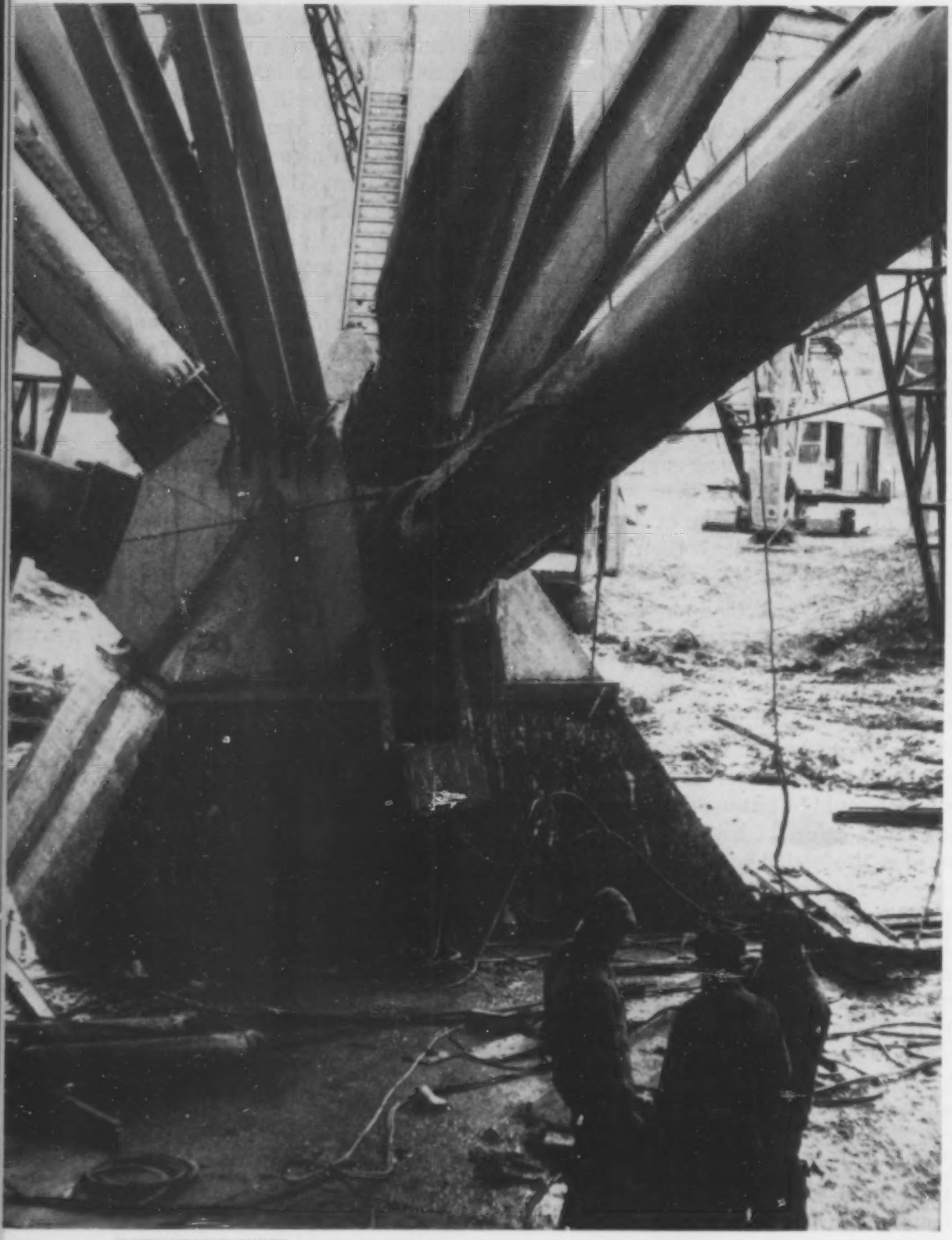
**A matter of money**

At schools like Cornell, which have an inflow of funds from federal and state sources, it is possible to carry on building research. The Cornell Housing Center operates with about $100,000 a year, $20,000 to $40,000 of it coming from government through the Agriculture Experimental Station. With this annual cushion, Cornell can keep its program in motion, drawing supplemental money from manufacturers and private foundations. The Russell Sage Foundation, for example, recently sponsored a Cornell study on home-buyer motivation, which looked into today's small house to determine whether its design satisfies the family's needs and desires. The study began with the families themselves—potential house buyers in the Buffalo area: the way they live, the things they hold important. This phase of the study was conducted by Cornell social psychologists. When these "human value" patterns were established, they were translated by Cornell architects and planners into sets of design guides for architects, builders, and bankers "in the interest of making today's small house more livable." And another Cornell study, on lighting the small home, is under sponsorship of a lighting fixture manufacturer, with other sponsors in the lighting field likely to come into it later on.

Other institutions, however, are not so fortunate as Cornell and must rely solely upon manufacturers for research funds. Good work can come from such associations. Two examples: the M.I.T.-Monsanto plastic house, designed by Architect Marvin Goody and members of the M.I.T. faculty, which pointed up many new applications for plastics in building and demonstrated plastic's worth as a structural material; and a thermal comfort project now under way at the University of Illinois, sponsored by Owens-Corning Fiberglas, which has the noble objective of developing a better house for tomorrow and not, like many limited projects, of simply reducing housing's costs. But most schools have neither the facilities nor the personnel for such major projects; the M.I.T.-Monsanto house represented a company investment of $1 million, including $22,000 for the M.I.T. work; the Illinois-Fiberglas project will cost $25,000. But, little research goes on elsewhere, retarding both building industry development and the professional development of students and faculty. BRI hopes that its new research program will stimulate activity at the schools and attract the needed money. But these hopes are tempered with realism, as BRI Executive Director William Scheick says:

*continued on page 206*

# Acrobatic structure in Brussels

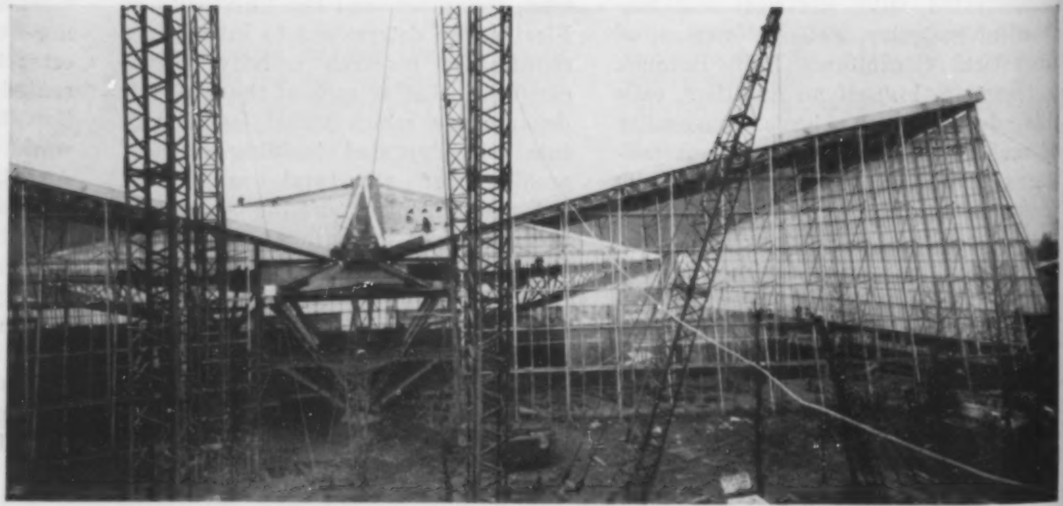


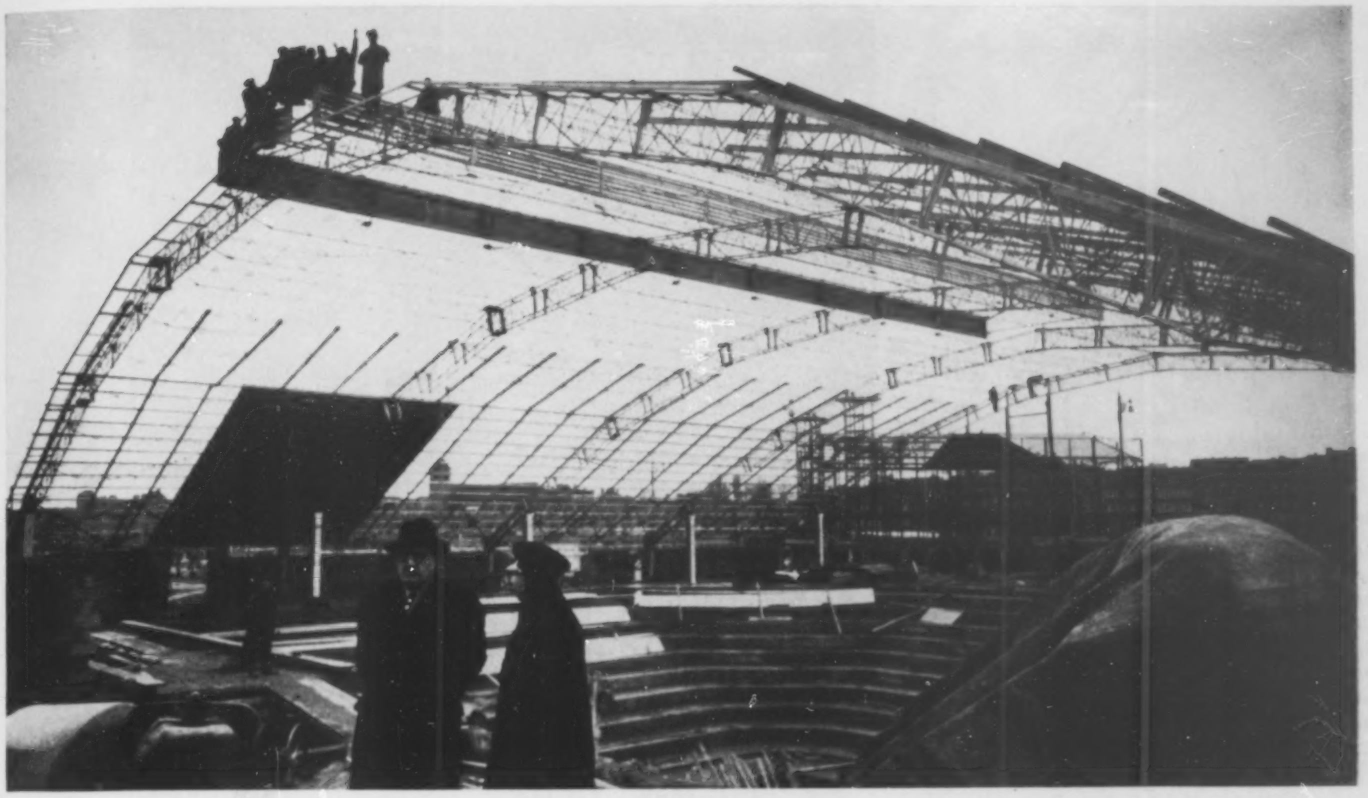
PHOTOS: MICHAEL ROUGIER

Visitors to the Brussels Fair, which opened last month, discovered that the fair is, among other things, the most versatile exposition of modern architectural and structural ideas to be put together in many a year. In the past, of course, world's fairs often have served as experimental grounds for new architectural and construction techniques. The great British Exposition of 1851 raised the famous Crystal Palace, forerunner of all the large steel-and-glass buildings in the world. No recent fairs, however, have posed a more *avant-garde* look in structural engineering than Brussels.

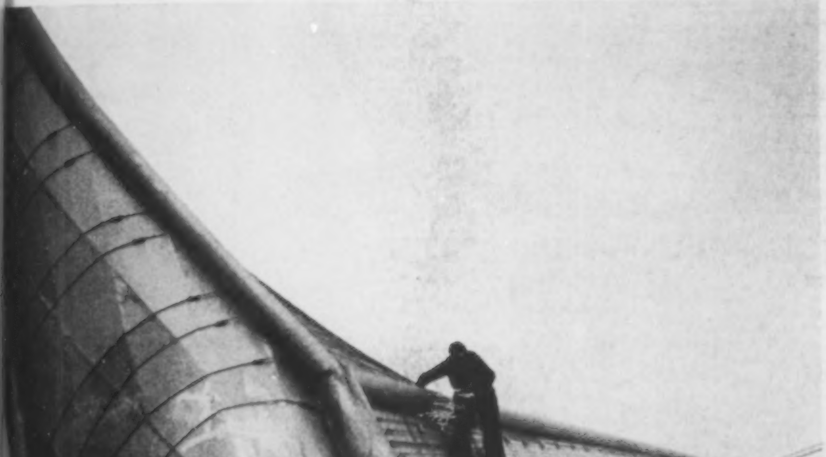
The dominant note in Brussels seems to be the new freedom made possible by the use of modern, improved materials in tension—from steel cable to reinforced concrete—a freedom that lends itself to acrobatic exhibitionism and that has its visible dangers, but one that is growing, nevertheless. Here in their final construction stages are some of Brussels' more interesting or simply amazing new structural ideas, photographed shortly before the opening. They run the gamut of the new acrobatic school of architectural-engineering design, from cable-hung roofs to hyperbolic paraboloid shells.

CANTILEVER ROOF of the French Pavilion, below, is one of the longest building spans ever attempted, each wing stretching 230 feet. The winged roof is supported mainly at a center ground point, while light walls hang like lacework from its soaring rims. Dimly seen at center of the building is the roof's massive pipe-end anchorage and counterbalance, shown in detail at left, which is sunk deep into a marshy site. Site and other difficulties have forced the use of additional roof supports, so that the pavilion as completed will not be pure cantilever.

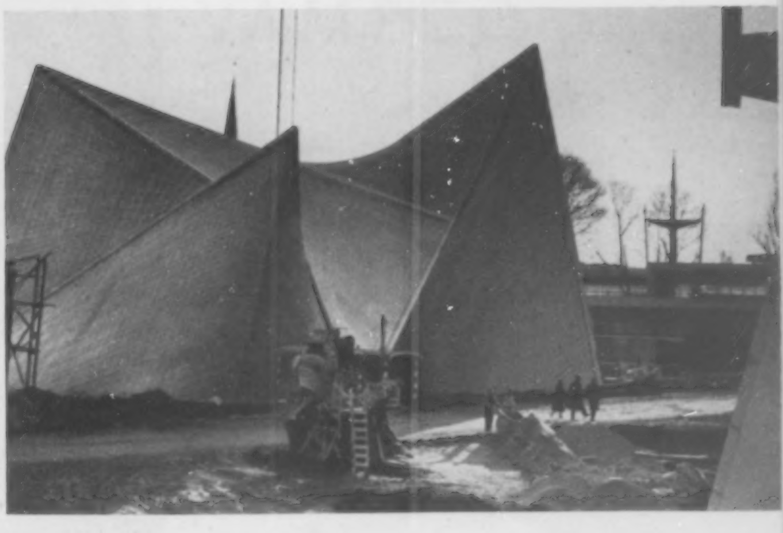


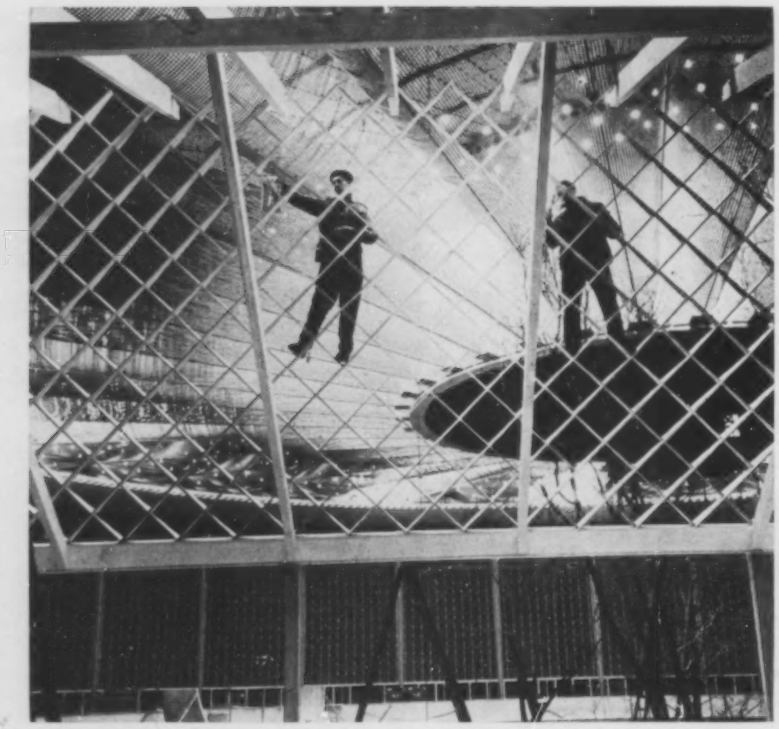


**SPACE FRAME ROOF** of the Water Follies pavilion, above, which will house a big swimming pool, weaves a spiderweb of delicate but strong trusses against the sky. These light, prefabricated trusses are calculated to distribute loads so evenly along their lengths that no center supports are needed, making possible framing of large free-span areas.

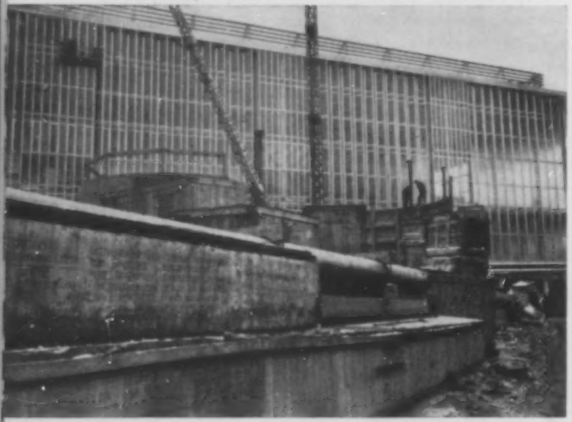


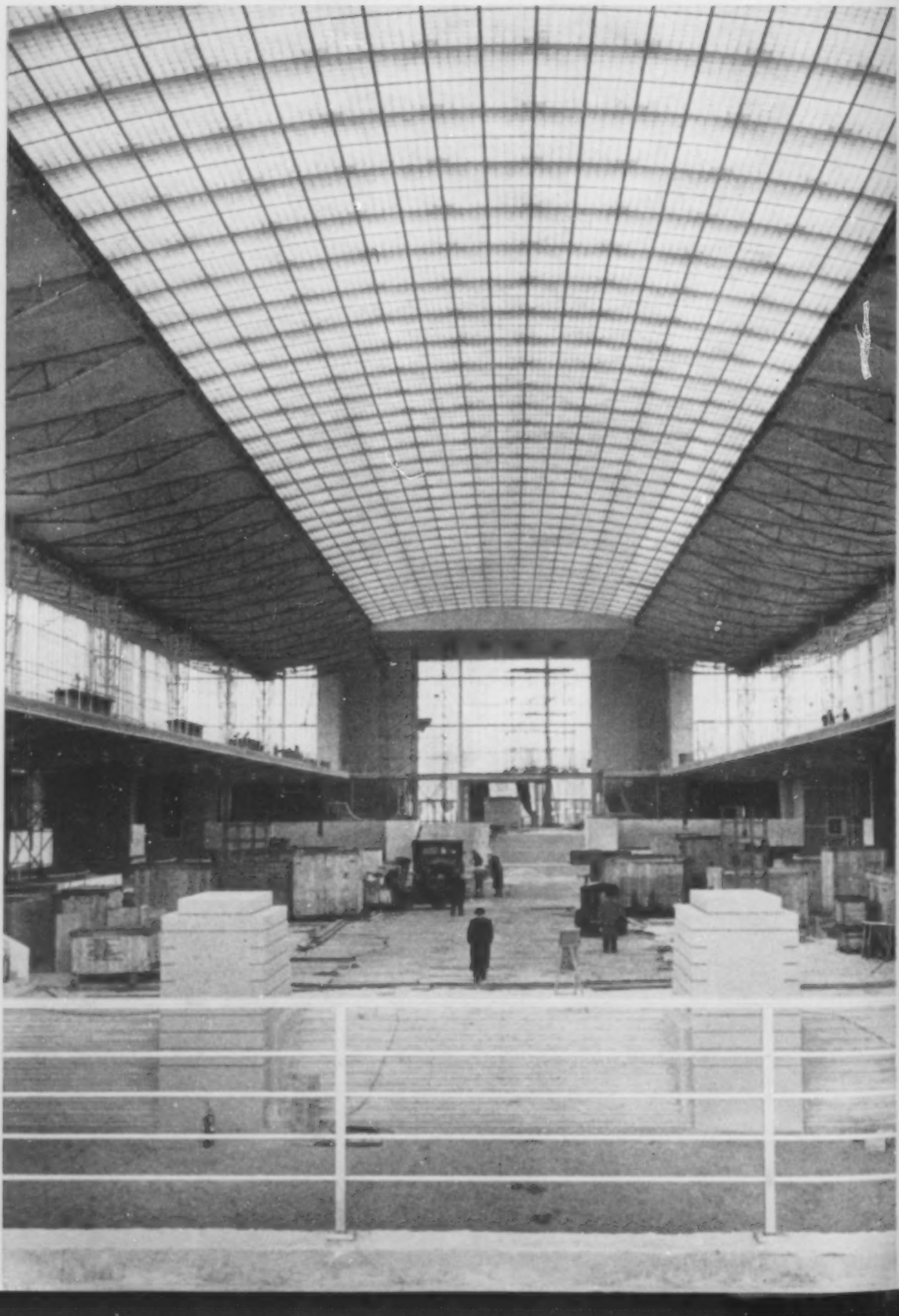
**HYBERBOLIC PARABOLOID SHELL** of Philips Pavilion, below, by Le Corbusier, is made of precast concrete slabs warped to the hyperbolic principle of generating compound curves from straight lines. Detail, left, shows how slabs are pretensioned in place by metal bands, then cemented over for smooth surface. Distinction of this building is that it is the first to use dissimilar paraboloids in a single design.





**CABLE-HUNG ROOF** of U.S. Pavilion, right, by Architect Edward Stone, is a pure suspension system. As seen above workers' heads in photograph, cables extend from the big steel ring in center of roof to concrete rim of the circular building. Plastic sheathing over the tensioned cables forms highly stable, translucent, bicycle-wheel roof of 381-foot diameter.





**SEMI-HUNG CANTILEVER ROOF** of the Russian Pavilion, right, is a hybrid structure. Short cantilever trusses on each side of the long room are supported from above by cables tensioned from posts on the open structure atop the building, as seen above. Between the trusses is a light, transparent, sheathed vault.

END

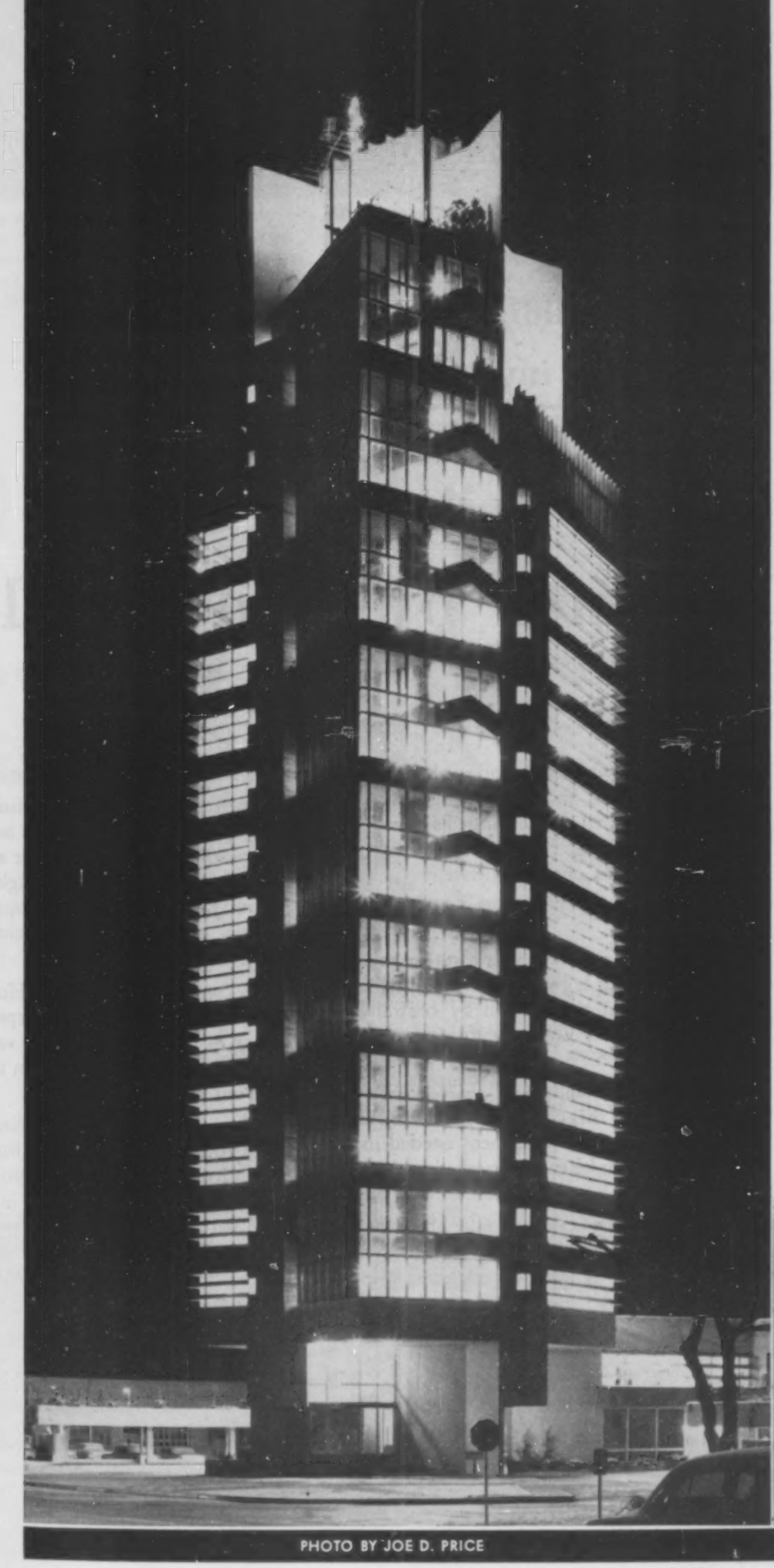


PHOTO BY JOE D. PRICE

Frank Lloyd Wright's

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TOWER

BARTLESVILLE, OKLAHOMA

*Aluminum Windows by*

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ALUMINUM DOORS AND
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# Start with a Systems Control Center by Honeywell

**In an office or any modern building, every major control function—both mechanical and electrical—can now be supervised at a single Systems Control Center, dramatically improving performance of all operational equipment.**

Through years of working with leading architects and consulting engineers, Honeywell has developed a new design concept for commercial buildings—Systems Control Centers.

They enable you, working with Honeywell to:

**Reduce a building's operating costs** by replacing legwork with cheaper, faster electrical signals and by centrally locating all controls for economical operation.

**Retard a building's obsolescence rate** because this completely flexible system provides for equipment needed in the future to be easily installed in the basic control network.

**Increase a building's utility** because Systems Control Centers give you more creative freedom in designing a building which exactly matches the needs of your clients, assuring satisfaction.

More than 350 Control Centers using the basic principles outlined here have been sold by Honeywell for all types and sizes of buildings throughout the country—including hospitals, schools, hotels, office buildings, banks, shopping centers and churches.†

You can profit from this Honeywell experience even before blueprints are started—can choose from a variety of functions to design a system that will fit your plans best.

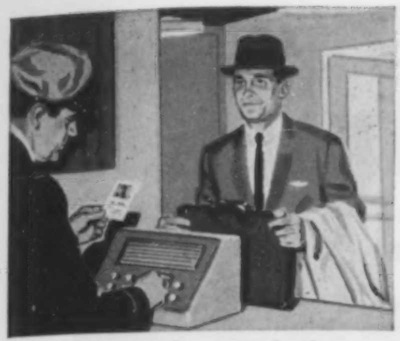
A Honeywell systems specialist will be glad to develop a proposal from your ideas for your evaluation. No obligation, of course. Call him in at the original planning stage. Call your nearest Minneapolis-Honeywell office or write Honeywell, Dept, MB-5-70, Minneapolis 8, Minnesota.

*†List of installations, including those in your area, available on request.*

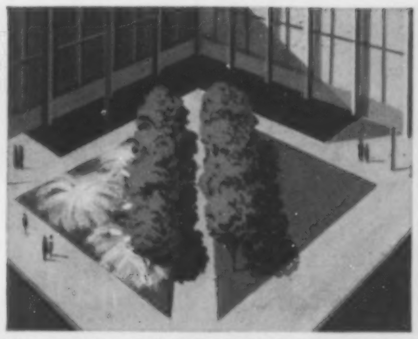
**Honeywell**

H HONEYWELL First in Controls

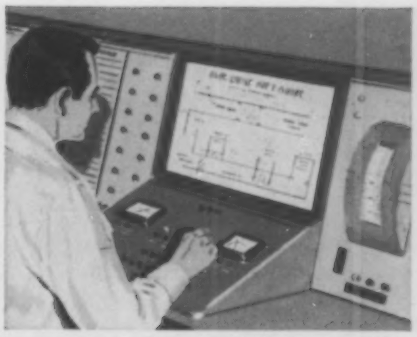
SEE THE HONEYWELL FILE IN SWEET'S CATALOG:
A/C 30d/Mi, SDC 30i/Mi, Hotel 33a/Mi



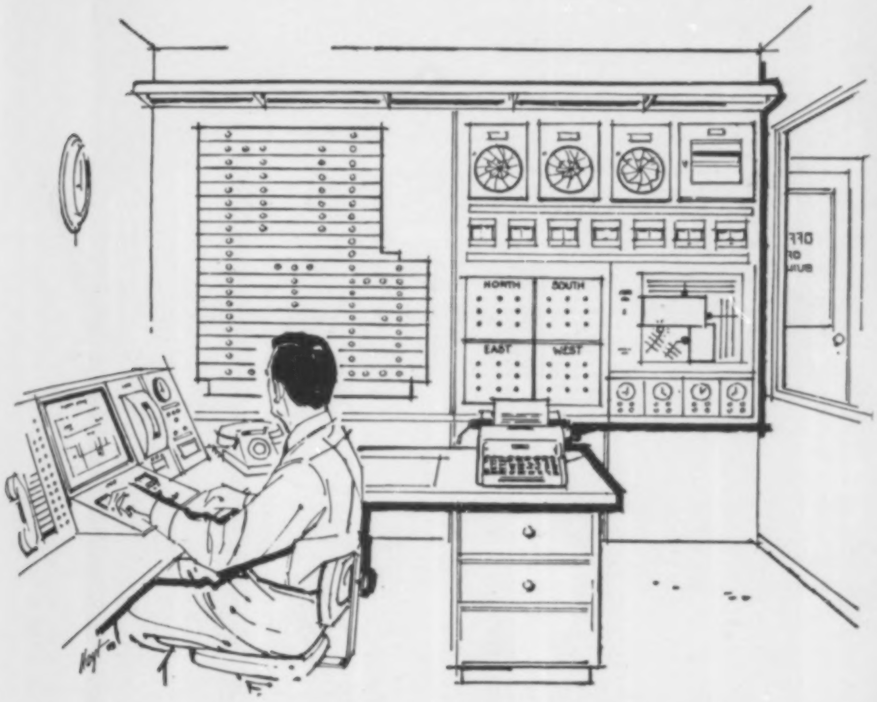
**Security alarm and communications** system provides intercom with guards, control and supervision of emergency lighting, burglar alarms, automatic switchover to auxiliary power, closed circuit TV for vaults.



**Supervision of plumbing** includes indication and warning of low or high levels, low or high pressure in the system; automatic switchover to standby equipment and graphic layout of the lawn sprinkling equipment.

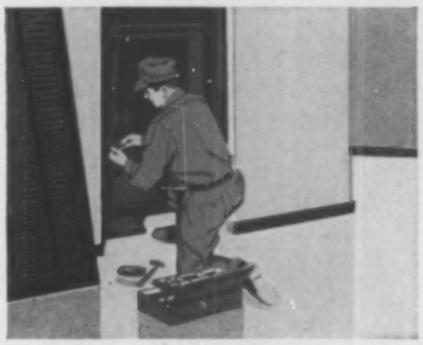


**Supervision of air conditioning system**—Console provides supervision and control of all equipment—pumps, fans, motors, compressors, valves, cooling towers and dampers. Controls temperatures in open areas.

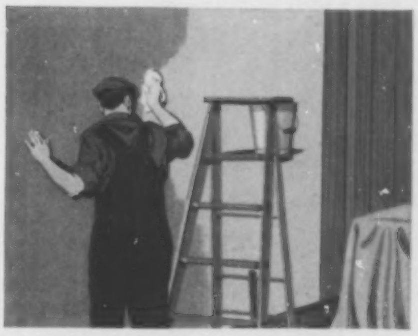


### Office Building Control Center

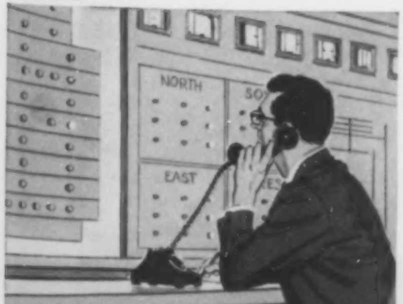
A Systems Control Center designed by Honeywell for office buildings could include all the functions described and illustrated on this page. More than 350 Centers utilizing the centralized control principle, ranging in size from less than a square foot to several times larger than the one shown, have been sold throughout the country.



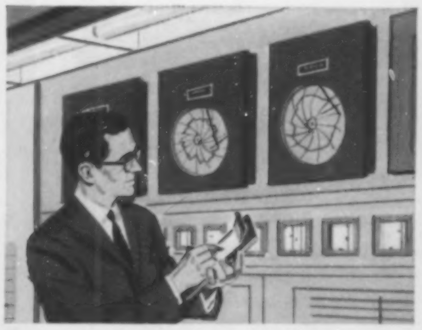
**Trouble detection and maintenance crew location.** From Control Center, supervisor spots trouble at any point in the system, dispatches crews to remedy. Crews push check-in buttons; lights on console show location.



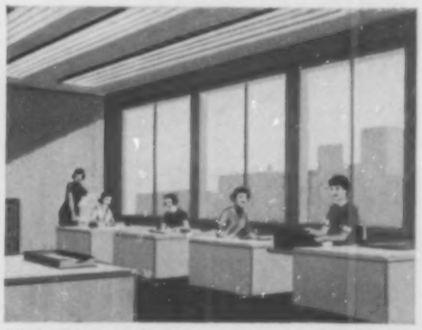
**Air Cleaner supervision and alarm.** Supervises air cleaner efficiency and warns if cleaners are inoperative, or operating inefficiently. Offers dramatic reductions in cleaning and decorating costs.



**Fire detection and alarm** system shows location of fire, enables quick action by supervisor. Control Center can also provide supervision of the automatic sprinkler system throughout the building.

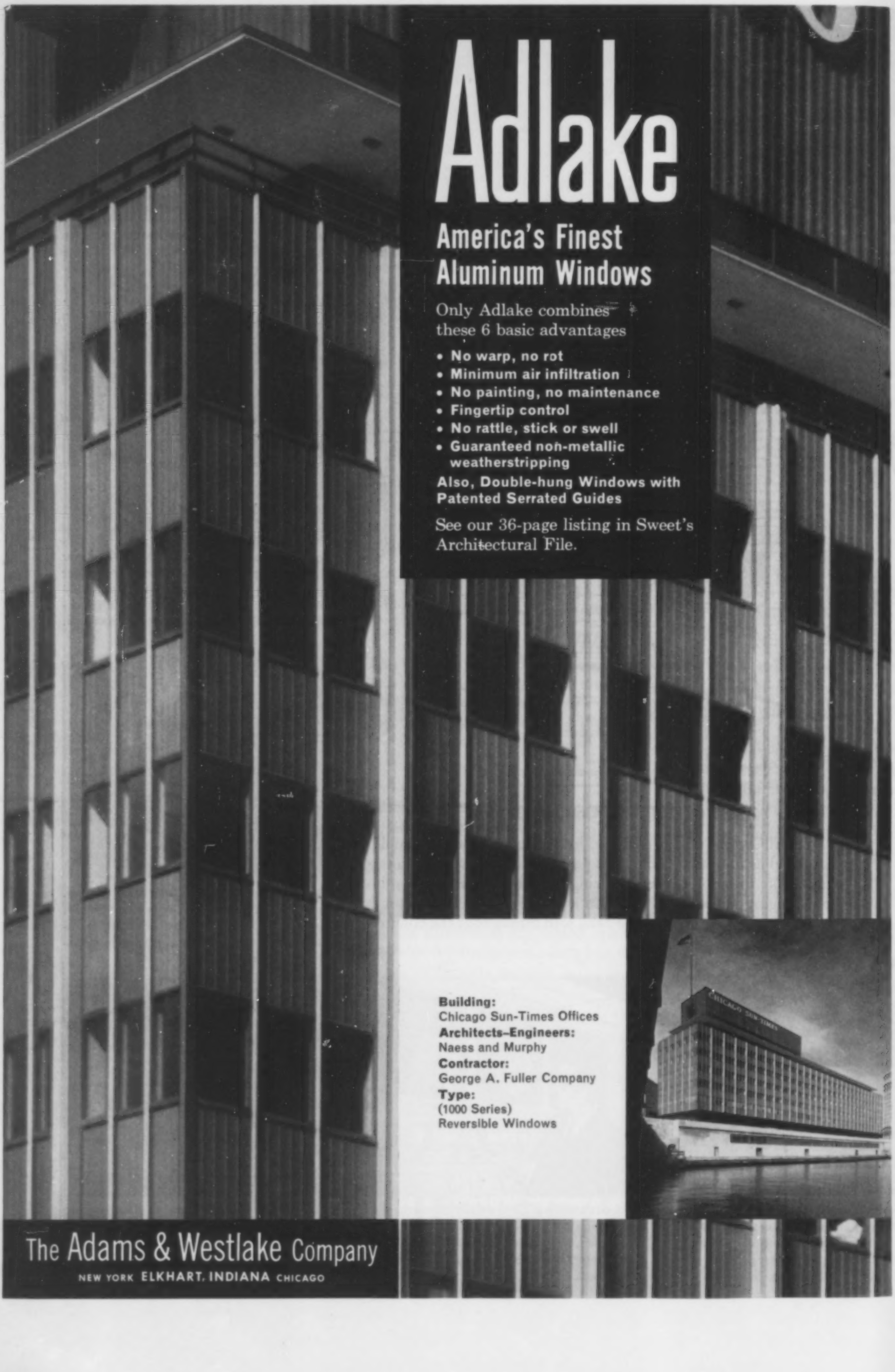


**Cost accounting** gives a daily departmental metered record of power, steam and chilled water used. A data logging system can provide a typewritten record for immediate use by accounting department.



**Light-Saver*** for such areas as stenographic pools, billing departments, automatically supplements daylight with artifical light. Reduces lighting costs up to 80%. Lighting can be programed from Control Center.

*Trademark



# Adlake

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Reversible Windows

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NEW YORK ELKHART, INDIANA CHICAGO

# New Eames chairs . . . radiant heating curtain wall . . . forest-clearing blade . . . magnetic light socket

## EAMES ALUMINUM CHAIRS styled for indoors or out

The sleekly sculptured, rugged, and remarkably comfortable chairs at left are the latest work of furniture-innovator Charles Eames. Engineered to withstand poolside or patio wear and weathering, yet styled to harmonize with the plushest contemporary interiors, these brightly polished aluminum chairs will be introduced later this month by Herman Miller as a high-priced "indoor-outdoor leisure group." Included in the group are a large, reclining lounge chair ($200 to $225), a smaller lounge chair ($125 to $130), a dining chair ($85 to $95), an ottoman ($50 to $60), and tables (prices yet to be announced).

Two aluminum antlers (the bow-shaped connecting bars sprung into the base and back of the chairs) give the group its bold, light look and structural strength. The base antler links the aluminum pedestal with the chair itself. The back antler serves as a convenient handle. Both force out against tapered side frames and keep the cushioning material taut and springy. Since the cushioning material (either vinyl or a woven plastic fabric) is heat-sealed and locked into continuous grooves that run full length along each side frame, weight on the chair is equally distributed all up and down seat and back. Triple thicknesses of material placed in three strategic locations prevent sag and contribute to the chair's comfort. The reclining chair and medium height lounge chair are mounted on swivel bases, and tilt of the reclining chair can be adjusted. All chairs are available in blue, gray, or brown plastic fabrics designed by Eames and Herman Miller's materials designer, Alexander Gerard, or in charcoal vinyl.

*Manufacturer:* Herman Miller Co., 31 Washington Ave., Zeeland, Mich.

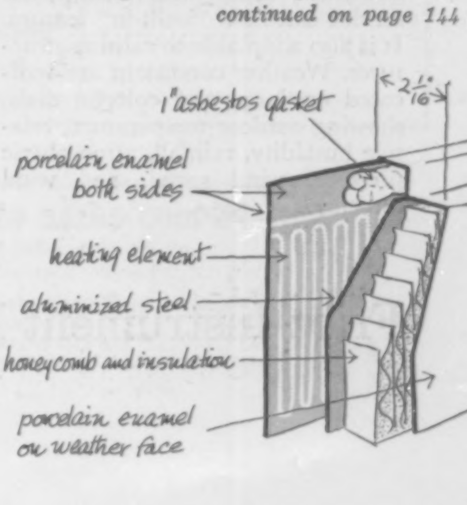
## ELECTRIC CURTAIN WALLS serve as radiant heating units

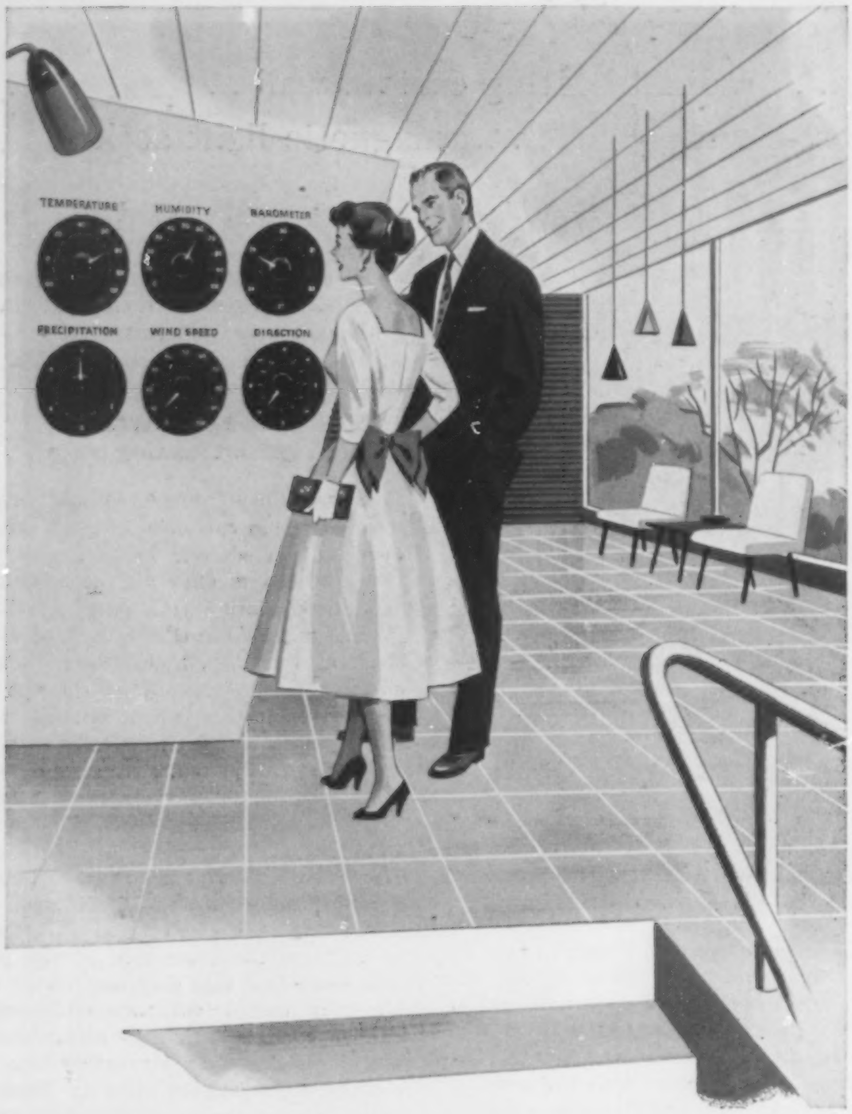
Bettinger Corp. announced the development of a thin curtain wall panel with its own built-in electric heating unit. The panel is said to offer all the advantages of radiant heating (efficiency, cleanliness, instant and uniform heat, lack of drafts, constant humidity, and low maintenance costs) and to cut installation costs at least 25 per cent: the system eliminates the need for central heating equipment and the space usually set aside for such equipment can be used for other purposes.

The new panel is essentially a club sandwich 2-1/16 inches thick consisting of a weather face of porcelain enamel steel, a vermiculite-filled asbestos honeycomb core, a reflector sheet of steel and a third sheet of steel in the room side of the panel. The inner face (see diagram) of the third sheet is coated with special porcelain enamel ceramic with high acid resistance and high dielectric strength. Onto this coating an aluminum alloy is fused and sealed with a screen of silicone. Parts of this silicone screen and the aluminum beneath it are then etched away, leaving a sinuous grid of aluminum which becomes the heating element. The sheet of steel inside the panel is aluminized to reflect heat rays from the heating element and thus minimize heat loss.

The manufacturer reports that similar panels used to heat a six-story New York City office building, owned by the Building Service Employees Union, have produced heat-bill savings of $11,000 in three years. However, actual savings in operation costs depend on the price of local power. Radiant heating curtain wall panels tie into

*continued on page 144*





NEW BENDIX "WEATHERMAN"...

*functional flair for your building designs*

Bendix' new "Weatherman"*, for accurate and instant reporting of just how the weather is outside, is a natural eye catcher. It's adaptable to a variety of buildings such as airports, banks, schools, TV stations, and many others where this public service can be a "built-in" feature. It is also adaptable to existing structures. Weather conditions are indicated on large and colorful dials, showing outdoor temperature, relative humidity, rainfall, atmospheric pressure, wind speed, and wind direction.

With the exception of the barometric pressure unit, each indicator is actuated by a remote (rooftop) transmitter and is connected to the transmitter by electric cable. "Weatherman" indicators and transmitters can also be obtained as individual units.

The "Weatherman" is made by Bendix Friez, makers of weather-data instruments for more than eighty years. For further information and installation data, write to Bendix Friez, 1318 Taylor Avenue, Baltimore 4, Maryland.

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Friez Instrument Division

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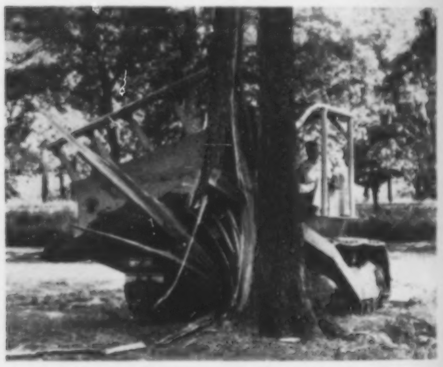
electric baseboards or raceways and are available now in custom sizes from the manufacturer at a cost about four times that of the firm's standard partition units.

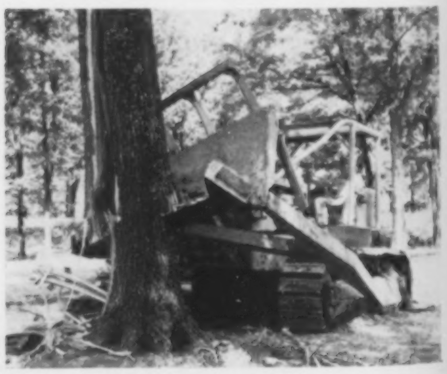
*Manufacturer:* Bettinger Corp., Gore St., Waltham, Mass.

### TRACTOR MOUNTED BLADE cuts, clears, and windrows timber

This knife-sharp, brutally effective *K/G Blade,* said to be the only piece of land-clearing equipment that both cuts and windrows heavy timber, can remove an acre of forest in about one hour. Large trees are first split and weakened by the "stinger" at the left of the horizontal blade (photos, below). The cutting edge is then rammed through the tree while a special push-bar fells it forward. The same splitting-shearing operation is repeated to cleave remaining stumps to ground level, and the full blade face is used, like a snow plow, to clean up and pile trees, stumps, brush, and debris into compact, soilfree windrows for burning. To remove roots or stumps below ground level the *K/G Blade* can be tilted and is effective to



*Verticle "stinger" splits the trunk.*



*Blade and bar fell the tree.*

*Blade cleaves the stump at grade.*

depths of about 2 feet. It can also be used for trenching V-type drainage ditches and for building fire roads. Cutting edge of the blade and "stinger" are of special alloy steel for maximum strength and long life, can be resharpened with a small portable grinder, and are replaceable. *K/G Blade* is designed for mounting on conventional bulldozers. Cost of the blade alone is about $4,000, F.O.B. factory.

*Manufacturer:* Rome Plow Co., Cedartown, Ga.

### BOOM-TYPE LOADER
**fills boxcar with lumber in 2 hours**

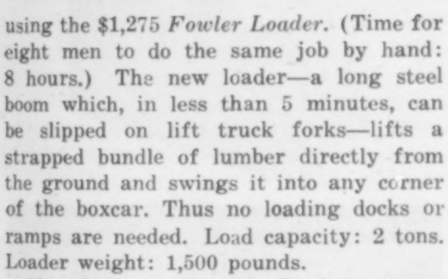
It takes two men just 2 hours to load or unload a railroad boxcar with lumber using the $1,275 *Fowler Loader.* (Time for eight men to do the same job by hand: 8 hours.) The new loader—a long steel boom which, in less than 5 minutes, can be slipped on lift truck forks—lifts a strapped bundle of lumber directly from the ground and swings it into any corner of the boxcar. Thus no loading docks or ramps are needed. Load capacity: 2 tons. Loader weight: 1,500 pounds.

*Manufacturer:* Signode Steel Strapping Co., 2600 N. Western Ave., Chicago 47, Ill.

### AUTOMATIC LOADING RAMP
**installs on top of existing docks**

A mechanical loading ramp, completely automatic in operation, simply bolts on top of truck docks. No expensive alterations or pit construction are necessary. Said to be the only automatic dockboard specifically designed for *existing* docks, the new mechanism, *Hi-Lo, Series 1200,* utilizes a counterweight system (much like those on overhead garage doors) mounted on the face of the dock between two rugged

*continued on page 146*



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Forever".

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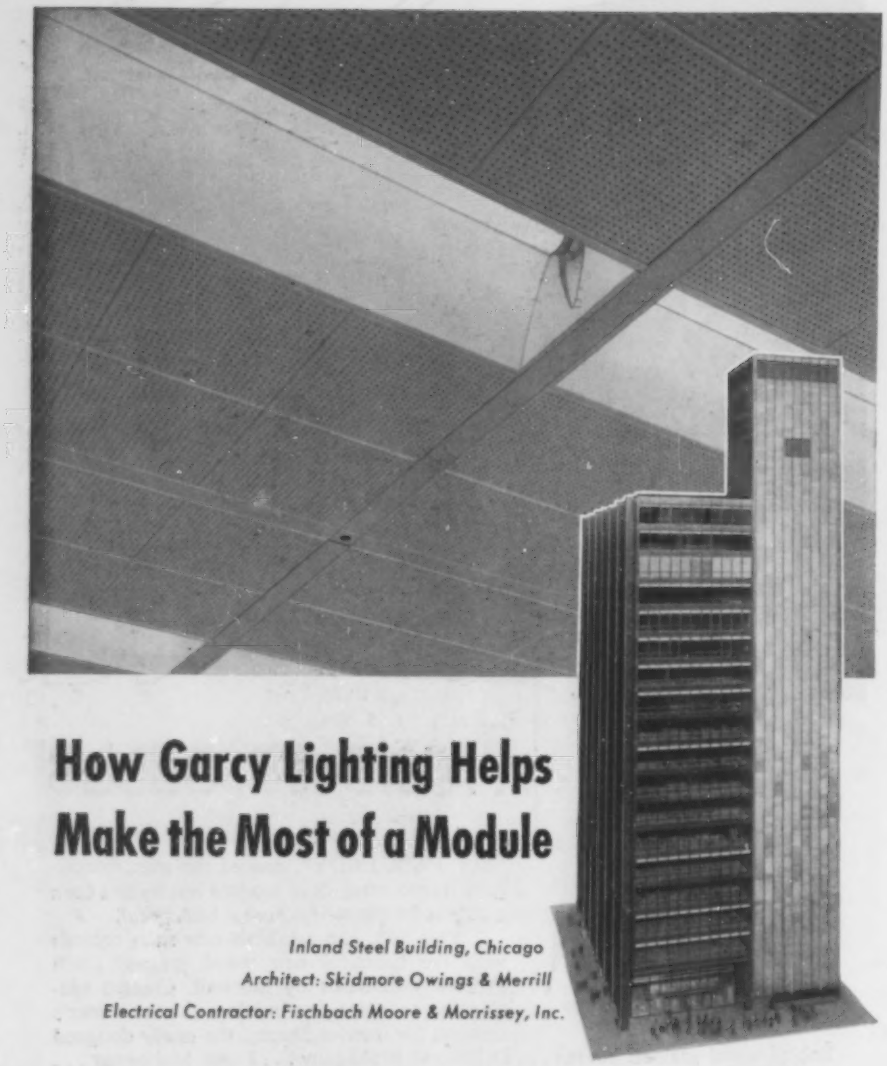
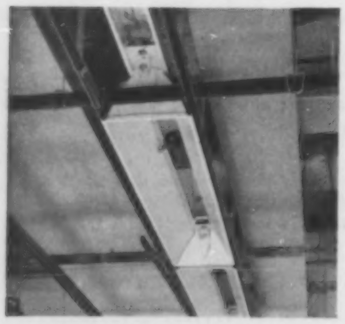


How Garcy Lighting Helps Make the Most of a Module

*Inland Steel Building, Chicago*
*Architect: Skidmore Owings & Merrill*
*Electrical Contractor: Fischbach Moore & Morrissey, Inc.*

**Newest of Chicago skyscrapers, the Inland Steel Building, integrates movable partitions, ceiling panels, air conditioning and lighting into a complete modular system.**



Continuously coupled wireway, separate from reflectors, simplifies fixture installation. Reflector spacing permits relocation of movable walls to any point on the 5'2" grid.

Important in this system are open bottom fluorescent troffers by Garcy, uniquely adapted to the modular condition. Wireway and reflectors are separate so that wireway can be continuous, while the 5' reflectors are spaced to accommodate movable walls at any point on the 5'2" grid.

These specially designed fixtures, as well as all others in the Inland Steel Building, were supplied by Garcy Lighting.

Write for Data Sheet 101.

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Preferred for Performance

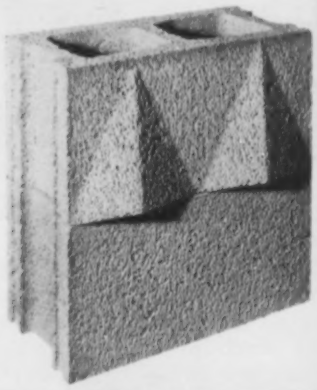
Garden City Plating and Mfg. Company
2471 Elston Avenue • Chicago 47, Illinois
In New York: 48 West 48th Street
In Los Angeles: Garcy Western Corporation, 3912 Broadway Place
In Canada: Garcy of Canada, Ltd., 1244 Dufferin Street, Toronto 4

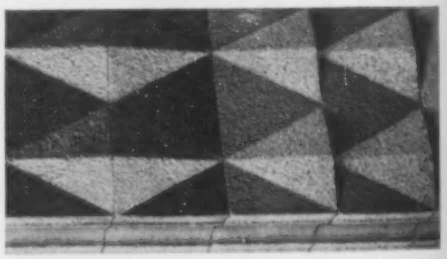
bumpers. A truck backing up strikes against the counterweight release causing the dockboard to fall into working position on top of the truck bed or tailgate. To compensate for uneven truck beds the ramp section automatically tilts. Standard models are 6 feet wide, and 8 or 10 feet long, have a roll-over capacity of 12,000 pounds, and sell for $550.

*Manufacturer:* Kelley Co., Inc., 2129 W. Mill Rd., Milwaukee 9, Wisc.

## PATTERNED CONCRETE BLOCKS break up monotonous wall surfaces

The two-core, concrete *Hi-Lite* block is cast with one or two raised pyramids on its face. It can be used in several combinations to relieve interior or exterior walls with a staccato of patterned highlights and shadows. The block's embossed pattern gives it a weight (41¾ pounds) about 1¾ pounds heavier than that of conventional masonry units. A light 29-pound block is also available. *Hi-Lite* blocks have a standard 8 by 8 by 16-inch dimension, an unfinished surface, and cost slightly more than conventional units. They will be produced and marketed by local block-makers whose machines are capable of using the manufacturer's special *Hi-Lite* molds.





*Manufacturer:* Besser Co., Alpena, Mich.

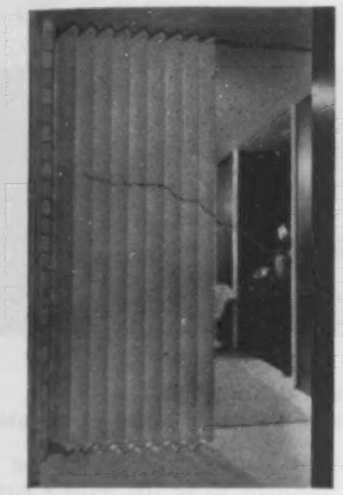
## ELECTRIC CARPET PAD designed to replace central heating

A British-engineered carpet pad, or under felt, that is plugged into the wall like an electric blanket will supply radiant floor heating in mild climates at a cost of about one cent an hour. The pad is designed to afford a 70 to 75 degree floor temperature. It sells in Britain for about $6.75 a square yard.

*Manufacturer:* Thermalay Ltd., Shelf Mills, Shelf, Yorkshire, England.

### LOUVERED DOOR
regulates light and ventilation

This wood door is made up of adjustable vertical louvers that can be opened or closed like a Venetian blind to control both light and ventilation. Closed, the louvers overlap to form a paneled wall section affording room-to-room privacy. In the open position, the airfoil-shaped louvers create a see-through divider screen. Called the *Louver-fold*, the door is 6 feet, 8 inches high and available in widths from 2 feet, 4 inches to 4 feet. The doors slide back and forth on a single overhead track. Louvers are of Philippine mahogany, 8⅜ inches wide, 1 inch thick, and are hollow (making the door light in weight). Retail prices range from $45 to $65.

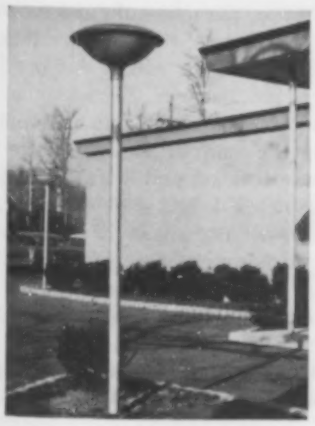


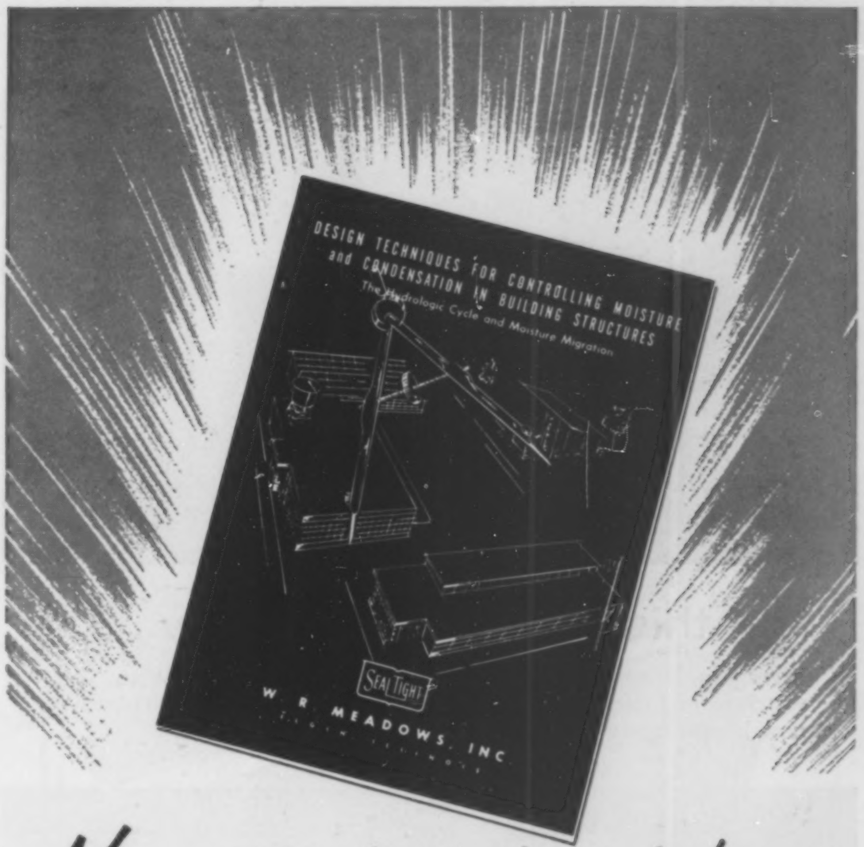
*Manufacturer:* Consolidated General Products Inc., 24th and Nicholson Sts., Houston 8, Texas.

### OUTDOOR LIGHT FIXTURE
features shatterproof globe

Designed for low-intensity lighting around playgrounds, parking lots, drives, and walkways, this outdoor lamp fixture has an aluminum-hooded, plexiglass diffusing globe that will not shatter (though it may crack) when smashed by a well-aimed rock or a long foul ball. Its purpose: to reduce costly losses resulting from vandalistic or accidental breakage. (In New

*continued on page 148*




DESIGN TECHNIQUES FOR CONTROLLING MOISTURE and CONDENSATION IN BUILDING STRUCTURES
The Hydrologic Cycle and Moisture Migration
SEALTIGHT
W. R. MEADOWS, INC

*Now available free of charge*

**"DESIGN TECHNIQUES FOR CONTROLLING MOISTURE & CONDENSATION IN BUILDING STRUCTURES"**

Modern developments in building construction, with trends toward a more monolithic structure, the increased use of insulating materials, and the use of glass and other impermeable materials in the shell area, have introduced new problems in the form of condensation and the uncontrolled migration of free water. Some of the more common types of damage resulting from condensation, are the blistering and peeling of paint, loosening of plaster, efflorescence of masonry, interior dirt patterns, mechanical destruction of structural elements, warping and rotting of floors and the incursion of termites.

Many past studies have treated vapor problems symptomatically, attempting to deal with a manifest difficulty. Here is a technical manual, the first of its kind, explaining in the architect's and engineer's own language, moisture movement, condensation problems and modern control methods for moisture and vapor movements. The manual gives factual proof of the effectiveness of impermeable materials in restraining moisture migration.

This book, now available free of charge through the courtesy of W. R. Meadows, Inc., has been specifically prepared to assist architects and engineers in protecting structures from migration of water in its various forms. Write today for your copy.

**W. R. MEADOWS, Inc.**

W. R. MEADOWS, INC., KIMBALL ST., ELGIN, ILLINOIS DEPT. 6
Gentlemen,
☐ Please send, without obligation on my part, a copy of the "DESIGN TECHNIQUES" Manual.
NAME FIRM
ADDRESS
CITY STATE

Casis School for Handicapped Children, Austin, Texas
Architect: Southerland & Page, Austin, Texas

on this side it's a window . . .

Mirropane® is a window and a mirror *at the same time.* When you watch from a darkened room you can see *through* the glass to observe how handicapped children are taught.

on this side it's a mirror!

In the lighted room, the same window is a mirror to teach pupils how to form words with their mouths and lips. And since they can't see you through the mirror, they are not self-conscious or distracted.

**MIRROPANE HAS MANY USES** in schools, hospitals, banks, jails, stores . . . anywhere you need a material through which to observe without being observed.

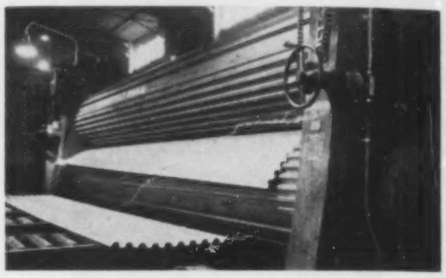
For complete details, call your L·O·F Distributor or Dealer (listed under "Glass" in the Yellow Pages). Or write to Liberty Mirror Division, Dept. LM-158, Libbey·Owens·Ford Glass Company, 608 Madison Ave., Toledo 3, Ohio.

L O F GLASS

MIRROPANE
THE SEE-THRU MIRROR
LIBBEY·OWENS·FORD GLASS COMPANY
Toledo 3, Ohio

York City such breakage is said to cost taxpayers $1 million a year.) All joints in the new unit are neoprene-sealed to keep out insects, dirt, and water. All metals are natural finished aluminum requiring no maintenance. Low in cost ($30 to $50) and light in weight (12 pounds), the fixture can be installed and serviced by one man, is intended for incandescent, fluorescent, or mercury vapor lamps, and either post-top or pendant mounting.

*Manufacturer:* Silvray Lighting Inc., 100 W. Main St., Bound Brook, N. J.



### LONGER DECK SHEETS
**produced by giant steel corrugator**

A 300,000 pound steel corrugating machine, reported to be the world's largest, is now turning out floor, roof-deck, and side-wall sheets in lengths up to 21 feet —or 50 per cent longer than possible heretofore. This increased length will permit greater flexibility in the spacing of framing members, and cut down the number of roof joists required. Naturally, longer spans should tend to lower over-all building costs and help speed up construction. In addition to increased length the manufacturer also claims that the strength of the sheets—because of unique die patterns —has been increased 33 to 60 per cent.

*Manufacturer:* Granco Steel Products Co., 6506 North Broadway, St. Louis 15, Mo.

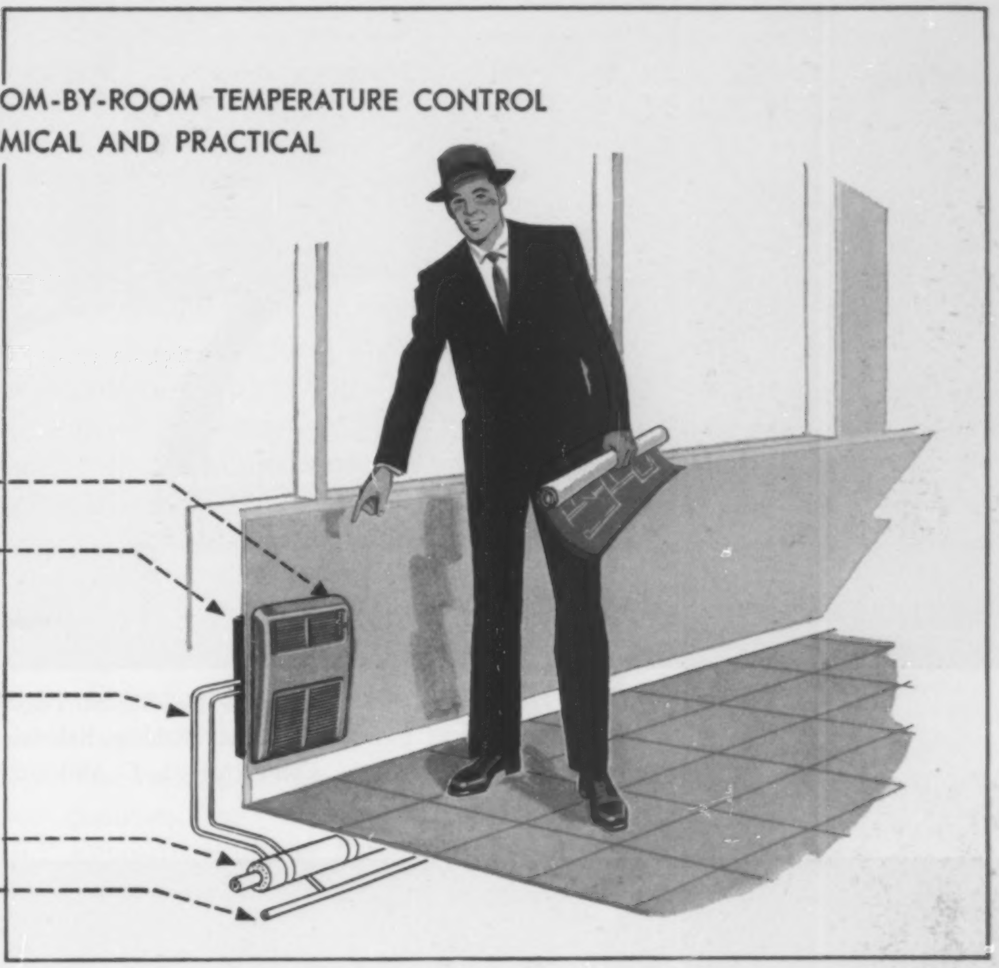
### MAGNETIC BULB AND SOCKET
**make relamping safe and easy**

A magnetic light socket and a bulb equipped with a special base plate have been developed by Inventor Adolph Buquor of Washington, D.C. and will soon be manufactured and marketed by the Marvel Lamp Company of Hoboken, N.J. Designed to replace the traditional screw-thread type, the new bulb and socket combination has two significant advantages: high-ceiling sockets can be easily relamped without the hazards of ladder or chair climbing (the Marvel bulb is simply held up, on the end of a long pole, to the magnetized socket and it leaps into place); the bulb self-locks and vibration, it is claimed, will not shake it loose. Low-cost magnetic adapters for conventional sockets also will be available from the manufacturer. Prices for the new units have not yet been announced.

*Manufacturer:* Marvel Lighting Co., Inc., 307 Newark St., Hoboken, N. J. END

## ACCURATE ROOM-BY-ROOM TEMPERATURE CONTROL NOW ECONOMICAL AND PRACTICAL

IRON FIREMAN
SelecTemp®
HEATING



**THERMOSTAT**

**AIR HEATING, FILTERING AND CIRCULATING UNIT**

Each room heater is an automatic unit, with steam heating core, air filter, steam driven fan and non-electric thermostat. Recessed in wall, requires no floor space.

**COPPER TUBING**

*Low first cost.* Substantial installation savings in new or existing construction. Flexible copper tubing concealed in walls and floors. Uses low pressure steam from boiler or district steam.

**STEAM SUPPLY**

**CONDENSATE RETURN**

# New answer to old heating problems

**The problem of room temperature control.** SelecTemp heating is a new application of steam heat in which heat from a central source (low pressure boiler or district steam) is automatically regulated in each individual room. Temperature control is very accurate.

**The problem of balanced heat.** The warm and cool sides of a building are uniformly heated. A thermostat in each room automatically regulates heat according to room needs, compensating for any exterior or interior heat loss or gain resulting from wind, sun, fireplace, or a varying number of occupants.

**The problem of varied temperatures for varied activities.** In a school, for example, SelecTemp meets the different needs of classrooms, gymnasium, library or shop.

**The problem of space.** SelecTemp uses no floor space; compact room units, only 18" high, are recessed into walls. Steam supply and return lines of small copper tubing are concealed in walls and under floors. Extra space is not required for ducts or rigid pipes, permitting unusual design freedom, and in most cases, savings in construction costs.

**The problem of modulated heat.** Air circulation is steady. Temperature is controlled by regulating the amount of warmth delivered—not by stop-and-go cycling. Temperature is remarkably uniform from floor to ceiling and from corner to corner.

**The problem of economy.** With all its advantages, SelecTemp costs no more than many conventional systems not providing this unique automatic temperature control of each room. Fuel is saved because unoccupied rooms can be kept cool and reheated in a few minutes. Occupants do not waste heat through open windows. SelecTemp heating is equally suited for use in both new and existing construction.

**SELECTEMP ROOM HEATER SPECIFICATIONS**

| | Model H-6 | Model H-12 | Model H-18 |
|---|---|---|---|
| Output, Btu/hr at 10 PSI | 6,000 | 12,000 | 18,000 |
| Wall opening | 17"x 6¾" | 17"x 11" | 17"x 15½" |
| Air Vol. CFM | 60 | 120 | 180 |
| Room heater supply line from main | ⅜" O.D. Copper Tube | | |
| Room heater return line to main | ¼" O.D. Copper Tube | | |
| Thermostat Range | 40° to 90° | | |

**See catalog in Sweet's Architectural and Light Construction Files**

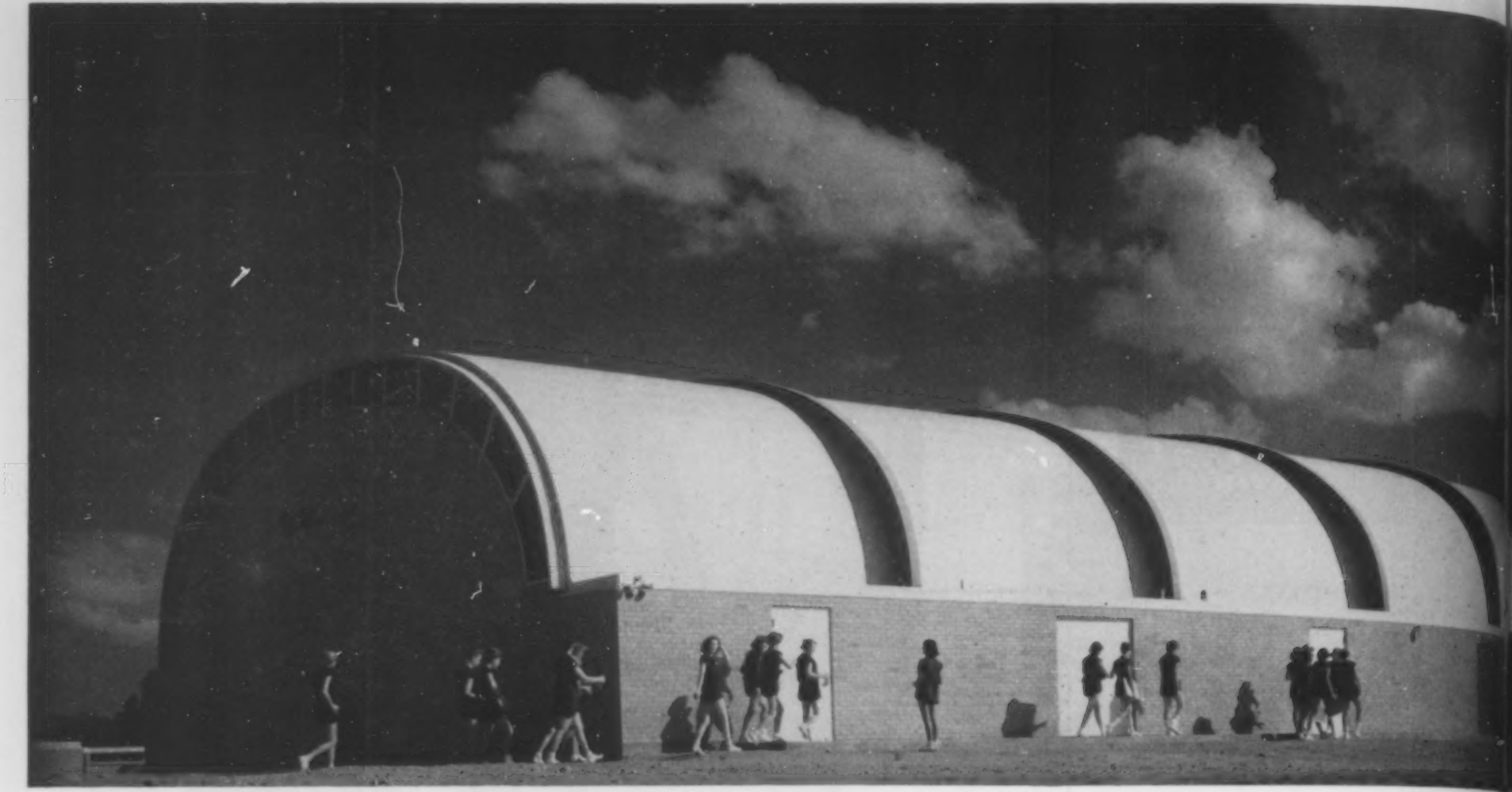
**IRON FIREMAN®**

*Engineered* HEATING AND COOLING

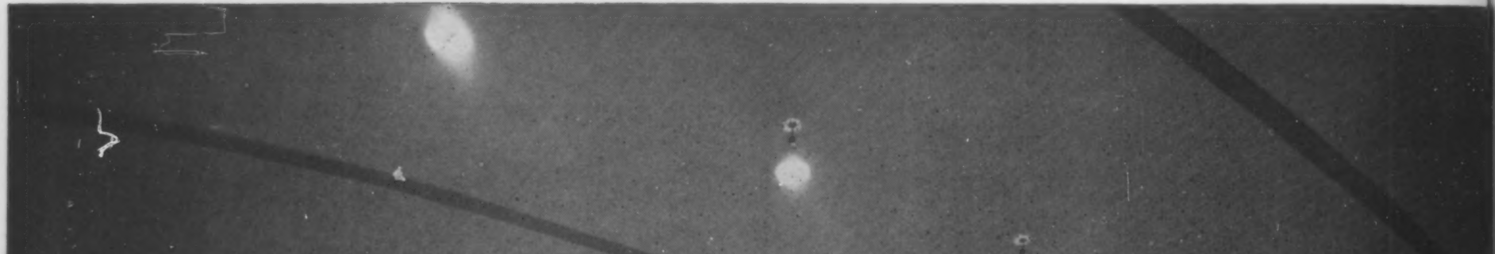
IRON FIREMAN MANUFACTURING COMPANY
3044 West 106th Street, Cleveland 11, Ohio
(In Canada write 80 Ward Street, Toronto)

☐ Send SelecTemp specifications and full information.
☐ Arrange for brief demonstration of SelecTemp room unit, in actual operation, in our office.

Name........................................................
Firm........................................................
Address.....................................................
City..............................Zone.....State............



Catalina High School, Tucson, Arizona
**Architects:** Scholer, Sakellar & Fuller, Tucson, Arizona
**Contractors:** L. C. Anderson & J. J. Craviolini, Tucson, Arizona



# ARCHED CEILING RAISES THE ROOF . . . LOWERS THE COST

Creative design and functional efficiency need not be hamstrung by budgeted dollars. Nor must structural and enduring qualities be compromised for economical construction.

This new school is an excellent example. Here, Fenestra* Acoustical "D" Building Panels form a combination structural roof and finished acoustical ceiling, replacing *five* different materials. They are erected in *one* operation, by *one* trade.

For curved structures like this, these lightweight, high-strength, cellular steel panels require minimum supports, and brace the steel arches at the same time. Notice the clean, uncluttered ceiling lines.

And *inside the panels*, just above the perforations, is a pre-formed, arched, sound-absorbing batt† which effects noise reduction coefficients up to 80%. The ceiling can be washed or painted without affecting acoustical qualities.

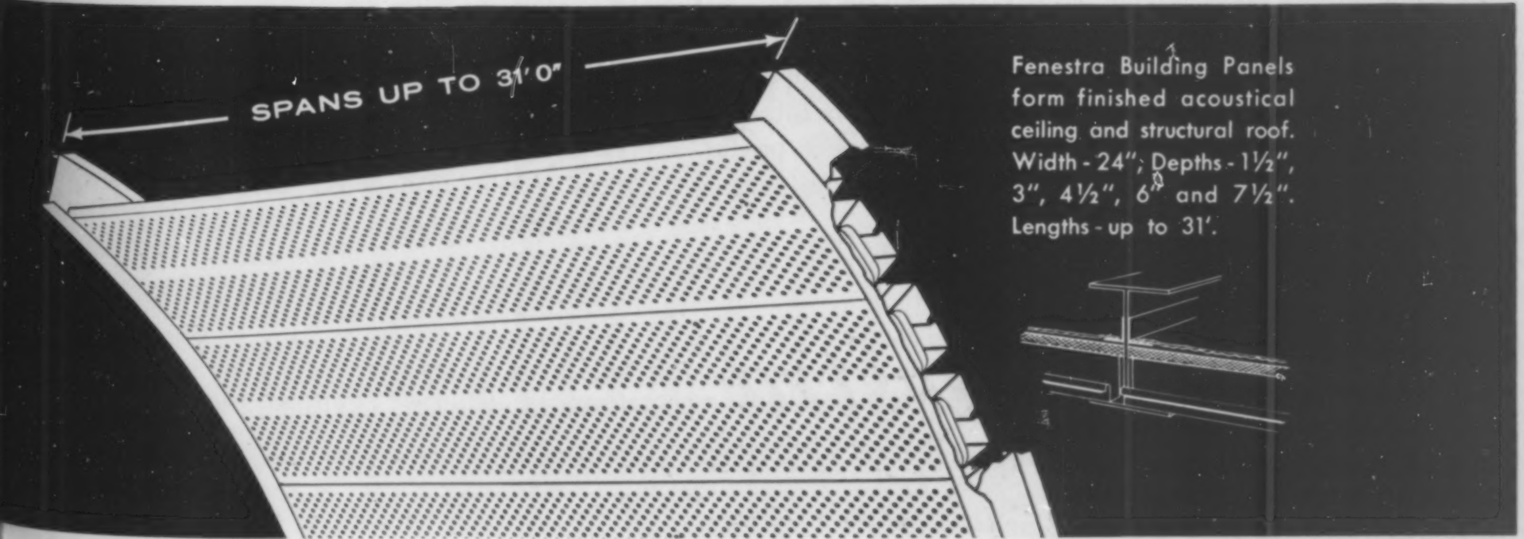
Write for FREE Fenestra Building Panel Catalog, or call your Fenestra representative. Fenestra Incorporated, Department AF-5, 2296 East Grand Boulevard, Detroit 11, Michigan.

*Trademark
†Patent Pending

**Fenestra**
INCORPORATED

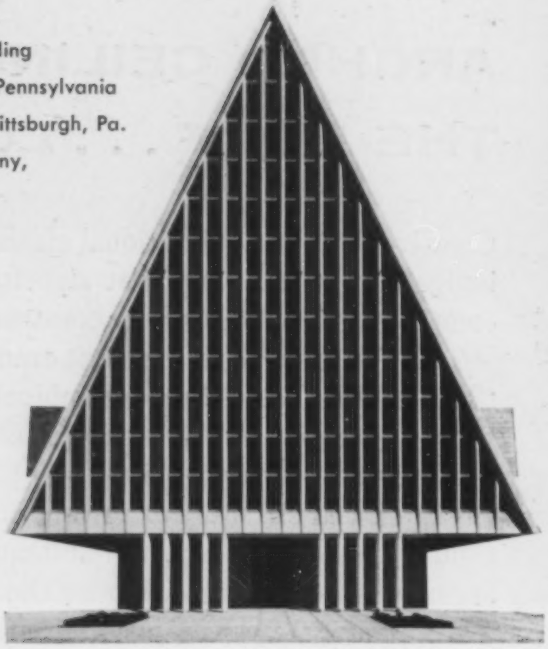
SEE OUR CATALOG IN SWEET'S
2F/FE

*Your single source of supply for building panels • curtain walls • doors • windows*



Fenestra Building Panels form finished acoustical ceiling and structural roof. Width - 24"; Depths - 1½", 3", 4½", 6" and 7½". Lengths - up to 31'.

Lodge Hall and Recreation Building
Masonic Home, Elizabethtown, Pennsylvania
Architects: Mitchell & Ritchey, Pittsburgh, Pa.
Contractor: The Pottiger Company,
West Reading, Pa.



# design possibilities unlimited! custom-engineered curtain walls

## . . . by *Fenestra*

One of these buildings is curtained with steel, the other with aluminum. Both systems are engineered by Fenestra®. They demonstrate the unfettered design freedom you have with this one-source curtain wall service.

We take your building design—single story or high-rise monumental—and engineer, fabricate, deliver and erect the curtain wall . . . *as a package!* Ordering from a *single* responsible source saves you the time and trouble of searching out and fitting together components from various sources. Fenestra coordinates production, delivery and erection to save time, money and eliminate confusion.

Fenestra offers you a wide selection of steel or aluminum curtain wall systems. A choice of subframes, windows and mullion patterns . . . a choice of vents including projected, vertical pivoted, double hung, top hung and casement . . . a choice of insulated panels, plain or embossed, porcelain enameled steel or aluminum. All materials, *including the panels* are produced by Fenestra.

Your local Fenestra representative can give you the details. Call him today—listed in the Yellow Pages—or write Fenestra Inc., Department AF-5, 2296 East Grand Boulevard, Detroit 11, Michigan.

*Fenestra*
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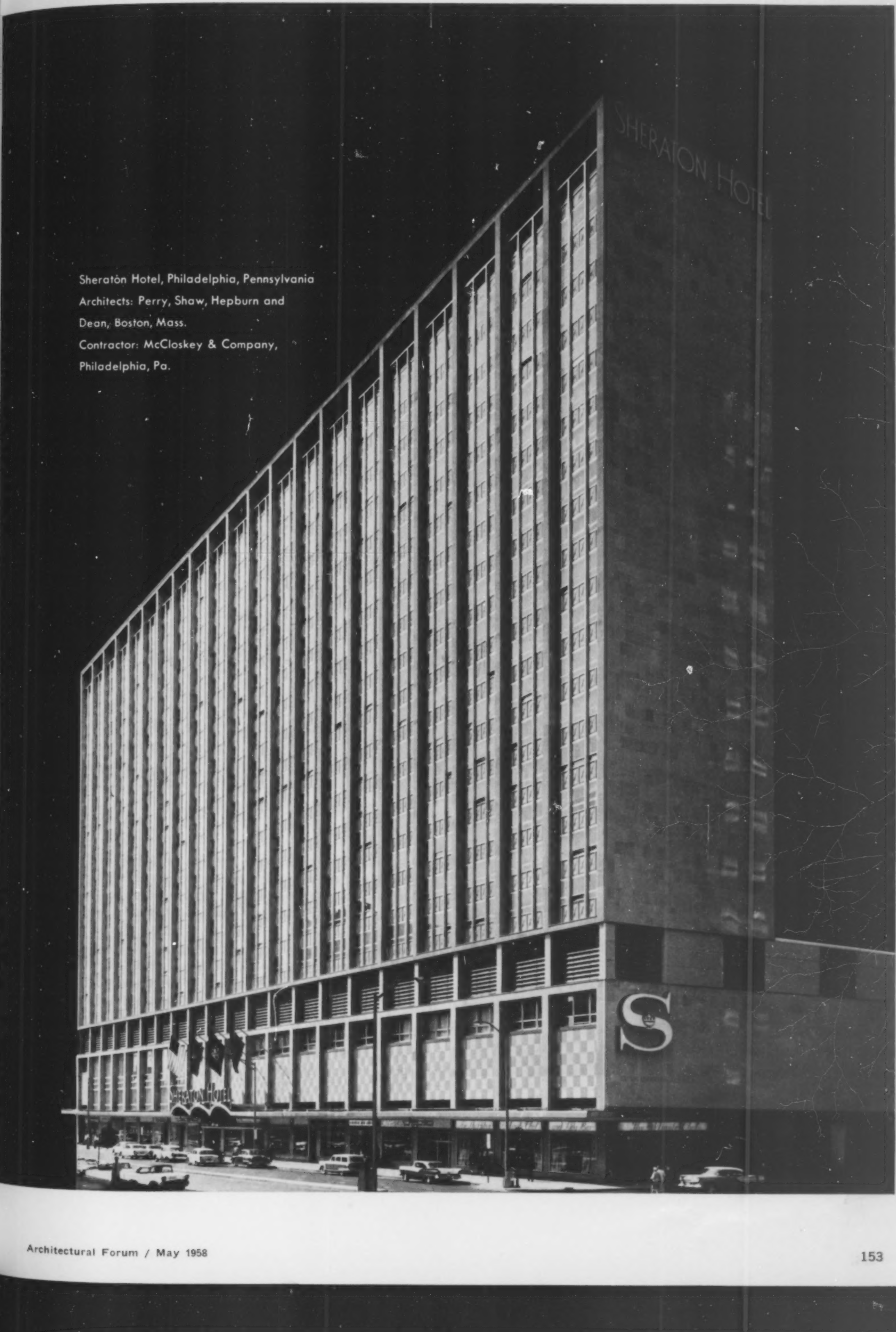
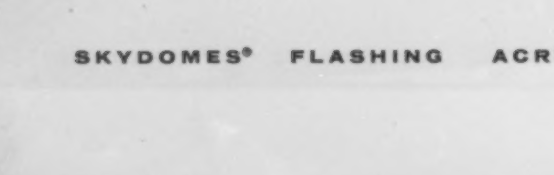
Your Single Source of Supply for
CURTAIN WALLS • WINDOWS • BUILDING PANELS • DOORS


SHERATON HOTEL
S
SHERATON HOTEL

Sheraton Hotel, Philadelphia, Pennsylvania
Architects: Perry, Shaw, Hepburn and Dean, Boston, Mass.
Contractor: McCloskey & Company, Philadelphia, Pa.

**MR. EDWARD D. STONE states**

**"I found the perfect solution to overhead daylighting problems – water-tight Wascolite Skydomes®."**



The Stuart Co., Pasadena, Calif.
Edward D. Stone, Architect.

Overhead daylighting does more than dramatize this pharmaceutical company's indoor court. It cuts artificial lighting bills and gives eye comfort, because it provides even, glare-free, reading-level daylight throughout the entire room.

You can obtain the same dramatic benefits whether you're designing an industrial, commercial, educational or residential building. There is a Wascolite Skydome that fits your every specification and need. Each Wascolite Skydome has an Acrylite® dome and a welded aluminum frame with integral weepage and condensation gutters that have proven effective in thousands of installations. For complete information see Sweets 20a/Wa or write:

**WASCO PRODUCTS, INC.**
Bay State Road, Cambridge 38, Mass.

SKYDOMES® FLASHING ACRYLITE® TUB AND SHOWER ENCLOSURES

*stretch your walls . . . and storage space, with . . .*

# new SIGNET MOBILE MIRRORS *by Carolina*

*Easy does it . . . install the Signet Mobile Mirror in minutes!*

*Give a dramatic look to a living area . . . add depth to a foyer . . . use Signet Mobile Mirrors!*

*Eliminate the "closet door look" and get full width, full height storage with floor-to-ceiling Signet Mobile Mirrors! Shown with Masonite® Duowall closet interior.*

Presto! Change! At first glance you have full mirror beauty. Then an easy touch . . . and the mirror slides into the wall . . . revealing full height, full width storage space. Simple and exciting . . . Signet Mobile Mirrors are a designer or an architect's delight . . . opening up endless design potentials. For bedroom closets (no doors opening out to take up space), small foyers in busy executive offices, new ways to increase space in dressing rooms . . . more light and space in manufacturers' showrooms—dramatic walls for living rooms—a refreshing way to bring terraces indoors. You . . . the designer . . . take it from here.

*The technicalities:* Signet Mobile Mirrors are designed for floor-to-ceiling, one-panel wall-pocket installation in new construction or in remodeling wherever two-panel by-pass construction is required. They slide silently on nylon tires in aluminum tracks. Libbey-Owens-Ford Parallel-O-Plate is framed in anodized aluminum available in mat black, satin silver or gold. Arrives pre-constructed and packed, ready-to-hang in a matter of minutes. Signet Mobile Mirrors are available through leading distributors—for additional information mail the coupon below.

**Trademark, Carolina Mirror Corp.*

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Please send me the name of my nearest distributor plus more information on Signet Mobile Mirrors.

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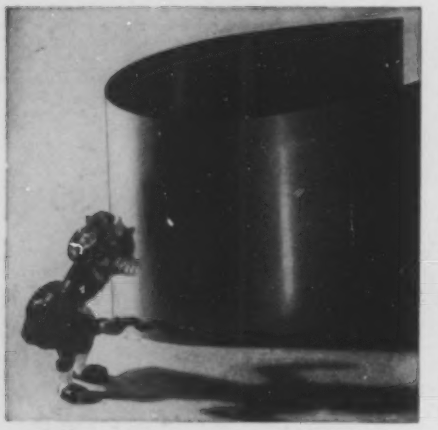
*Please attach coupon to your letterhead.*

**MOBILE MIRRORS* BY** *Carolina Mirror Corporation, North Wilkesboro, North Carolina*

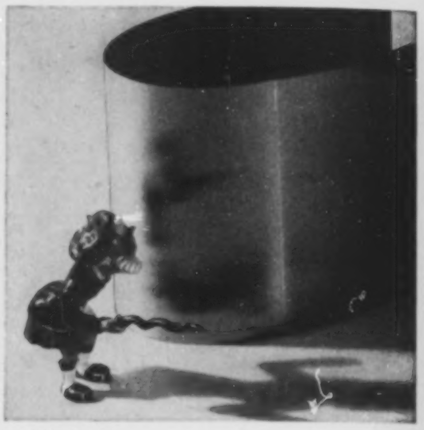
# No matter which FINISH you like—you can buy it in

# *MicroRold*® QUALITY STAINLESS STEEL



**2D**—A silvery white, but non-lustrous, surface produced by annealing and pickling cold reduced material. Steel sheets & strip in this condition are most ductile and the surface holds lubricant well for severe drawing operations.

**2B**—Steel in the 2D condition which is subsequently rolled on a "skin pass" or temper mill. The surface acquires a bright finish from the polished rolls. This surface is somewhat more dense and hard than 2D and is a better starting surface for later finishing and buffing operations.



**No. 3**—This surface is made by grinding with a No. 100 abrasive. This surface is smooth but not as reflective as 2B.

**No. 4**—A finer finish than No. 3 made by grinding with a No. 150 abrasive. Like No. 3, this surface is easily blended with hand grinders after forming, drawing or welding.

**No. 7**—Good reflectivity and brilliance made by polishing with a No. 400 abrasive. This semi-mirror finish must be protected during fabrication by adhesive paper or strippable plastics lest the finish be marred beyond repair.

**BRIGHT**—A highly reflective surface made by cold reducing with highly polished, glass-hard rolls. This finish is only available in Type 430 stainless.

These are our standard surface finishes that are available in types 201, 202, 301, 302, 304 and 430 except Bright which is type 430 exclusively.

**These finishes are regularly supplied in sheet and coil form in widths up to 48 inches.**

Since Nos. 3, 4, 7 and 430 Bright are smooth reflective surfaces, they are not recommended for severe drawing without special precautions as the mill finish may be marred. Applications such as dairy machinery, kitchen and restaurant equipment and architectural decorative work require only local forming, so these highly polished surfaces are not greatly disturbed. All mill polished sheets are carefully packed to avoid handling imperfections. Protective adhesive paper can be specified by the buyer when needed.

For specific information on recommended surface characteristics for a particular stainless steel sheet and strip application, address your request to our Product Development Dept.

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STAINLESS
SHEET & STRIP

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*Producers of Stainless Sheet and Strip Exclusively*

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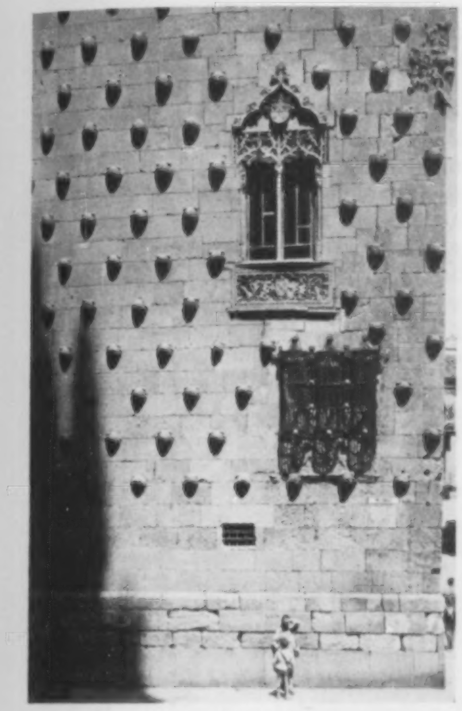
## From the Khmers to Corbusier



Artful wall in Salamanca.

Carvings of the Khmers in Cambodia.

**SPAIN.** By Michael Wolgensinger. Published by Frederick A. Praeger, Inc., 15 West 47th St., New York 36, N.Y. 9" x 11¾". Illus. $6.

An extremely gifted Swiss photographer and the consistently apt craftsmen of Swiss printing have collaborated to produce a book on Spain that is at once reportorially sound and beautifully poetic. It is the poetry of a tradition-bound civilization which has continued to meet the demands of each new day with characteristic grace and passion. Even the bitterest actualities of today, as represented by Wolgensinger's camera, reflect the legends of the past. The ragamuffins blinded by the sun outside Salamanca's *Casa de Conchas* (left) are understood best when pictured with the shadows and symbols of the past close about them. A profoundly moving collection of photographs of buildings, people, and landscapes.

**THE ARTS AND CIVILIZATION OF ANGKOR.** By Bernard-Hilippe Groslier. Published by Frederick A. Praeger, Inc., 15 West 47th St., New York 36, N.Y. 230 pp. 9¼" x 11". Illus. $15.

A civilization that expressed itself unrestrainedly in its buildings was that of the eleventh-century Khmers, who lived in the jungle-infested delta that is now Cambodia. The extraordinary complex of ruined temples, hallways, and administration buildings known as Angkor is the Khmers' monument. Our knowledge of the Khmer civilization is barely a hundred years old, and this is the first, full pictorial treatment of its lovingly wrought architectural environment. It is accompanied by an informative text written by the son of a pioneer archaeological explorer of the ruins. One of the author's interesting themes is the horizontality of the Khmers'

*continued on page 158*

The Angkor Wat, humble yet elegant.

Fixed columns
•
adjustable shelves

**Adjustable Height WALLMOUNTS**

**Schooline®**
**WARDROBE SYSTEMS**

Solve the pupil wraps problem efficiently with Wallmount Coat and Hat Racks. Mount on any available wall space. Hat shelves and hanger bar adjustable on permanently attached columns to height for any age group. Double hat shelves and double row of spaced coat hooks accommodate 6 pupils per running foot. Basic 3' 2" or 4' 2" units interlock to make continuous racks to fit any space or capacity requirements.

**OTHER *Schooline®* UNITS**

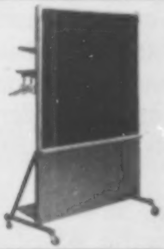
This is a Chalkrobe

**CHALKROBE®**

Dual-purpose wardrobe rack. Provides two 4 ft. hat shelves, 4 ft. Hook and Hanger rails for coats adjustable in height to all age groups. 4 ft. overshoe shelf. And, on other side a 50" x 48" chalkboard. Portable or stationary.

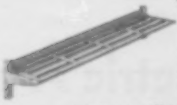
**CORKROBE®**

Identical to Chalkrobe but with pin-up cork board instead of "Chalkboard". These units permit complete flexibility in use of floor space. Can be anchored to floor, or wheeled about on casters. Hold wraps out of the way in orderly and efficient manner.



**CLOSURE UNITS**

With closure panels (as original equipment or add-on units) Chalkrobe and Corkrobe units serve as flexible room dividers, movable walls or screens. Widely used to enclose temporary class rooms, to "build" cloak rooms, meeting rooms, etc.



**OVERSHOE RACKS**

Matching units for Wallmount. Keep overshoes off-the-floor in an orderly manner.

*Write for "Schooline" Catalog 48*

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CRAWLING
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STRETCHING

NE BASEDUCT ELIMINATES THEM ALL . . .
It's the low cost, good looking, easy-to-install baseboard wiring system

A combination multi-outlet assembly and surface raceway system at the baseboard level. Baseduct provides for complete electrification in new or modernized homes, apartments and commercial buildings.

The spacious raceway in the lower area of National Electric Baseduct houses a maximum number of wires for all normal branch circuit requirements.

Fast-to-install, Baseduct goes in directly on the floor . . . needs no footers, trim or capping. Cover may be removed and replaced regardless of the finished floor covering or trim.

Write for complete information today. Baseduct is listed by Underwriters' Laboratories Inc.

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PITTSBURGH, PA.
4 Plants • 12 Warehouses • 41 Sales Offices
In Canada, Nepco of Canada, Ltd.

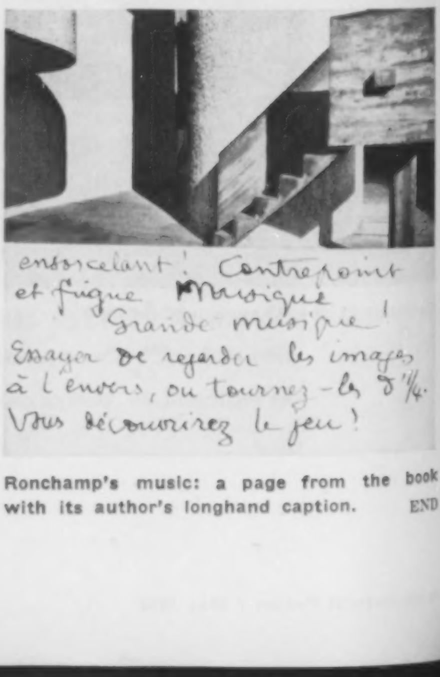
architecture, denoting a more humble approach to city building than can be found in the West. Humble perhaps, but elegant and exhuberant as well.

**BETTER TRANSPORTATION FOR YOUR CITY.** By National Committee on Urban Transportation. Published by Public Administration Service, 1313 East 60th St., Chicago 37, Ill. 112 pp. 8½" x 11". Illus. $5.

This handbook was prepared by the National Committee on Urban Transportation to help cities do a better job of transportation planning. The suggested program of action calls for systematic collection and analysis of basic facts, is adaptable to any community or metropolitan area, and covers highway, transit, and terminal improvements. The program has been endorsed by the Joint Committee of the American Municipal Association and the American Association of State Highway Officials, the American Transit Association, and also by the Commerce Department's Bureau of Public Roads, which participated actively in its preparation.

**THE CHAPEL AT RONCHAMP.** By Le Corbusier. Published by Frederick A. Praeger, Inc., 15 West 47th St., New York 36, N.Y. 136 pp. 7¾" x 8". Illus. $5.50.

This is a handsome book of photographs and drawings chosen by Le Corbusier to explain the ideas behind his extraordinary chapel at Ronchamp, France, and to describe the finished building. The latter is shown not as a lifeless piece of sculpture, but as a living and breathing building of considerable meaning to those who worship in it. To those who have wondered about Le Corbusier's transformation, since World War II, from a master of Machine Art to an equally accomplished master of almost primitive and rough Peasant Art, this book will reveal many facets of his genius. His brief, lyrical text sounds a little odd in its English translation, but it is added proof of Corbu's versatility and vitality.



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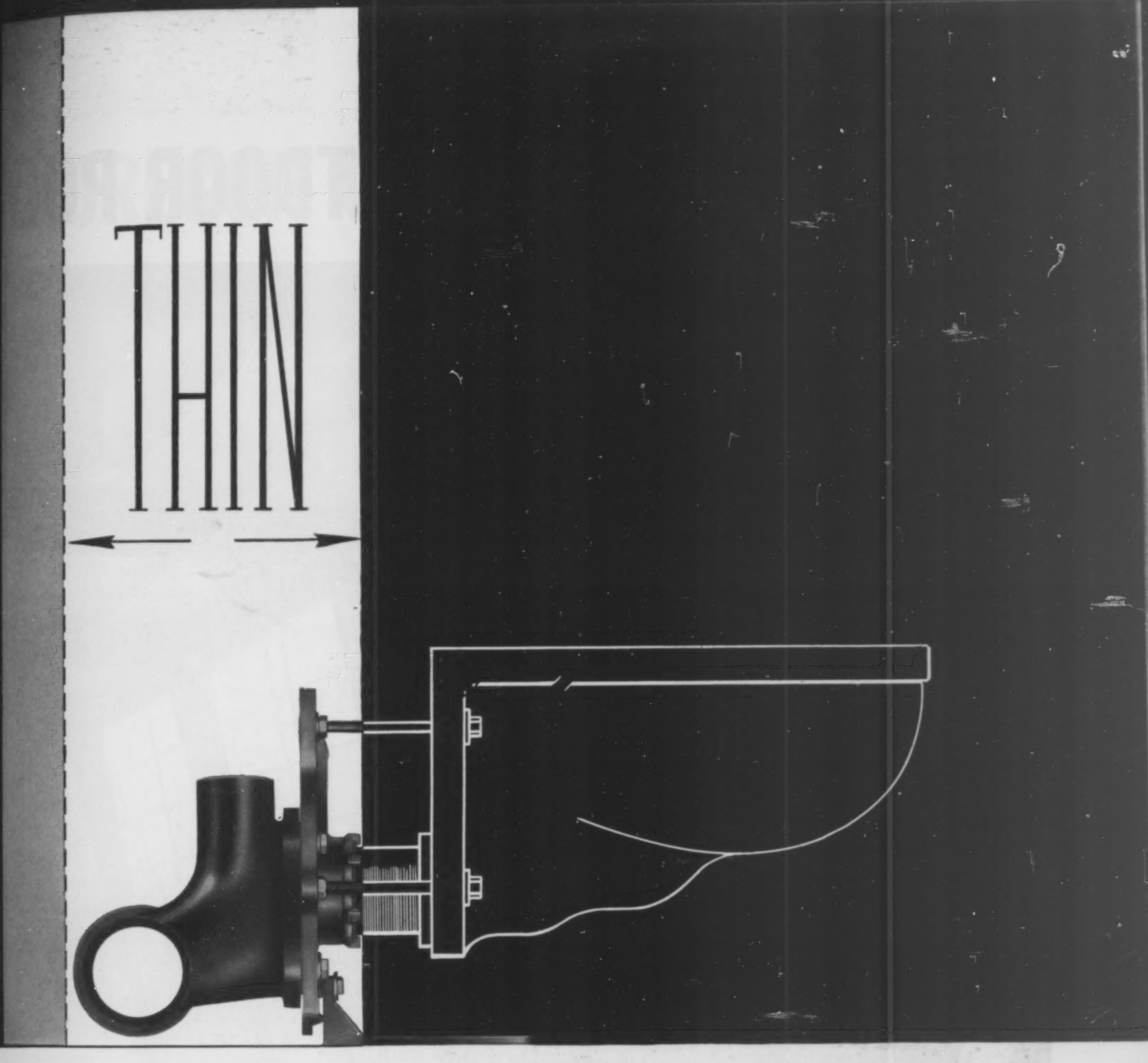
et fugue Musique
Grande musique!
Essayer de regarder les images
à l'envers, ou tournez-les d'¼.
Vous découvrirez le jeu!

Ronchamp's music: a page from the book with its author's longhand caption.

END



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HERE'S THE "PERFECT" SUPPORT FOR YOUR MODERN, ULTRA-SANITARY WALL-TYPE PLUMBING FIXTURES. It's slimmer . . . stronger . . . easiest to select . . . specify . . . and install. Years-ahead advantages you naturally expect—and always get—from the original developer of *engineered* wall-type plumbing fixture supports.

ALL-NEW, DETAILED CATALOG, TOO. **FREE!** FOR DESIGNERS . . . SPECIFIERS . . . INSTALLERS . . . OWNERS Contains latest minimum space requirements and up-to-date roughing-in dimensions, on the complete line of newly-designed ZURN THINLINE SYSTEMS for supporting wall-type closets, urinals, lavatories and sinks. *Write Now!*

*A Step Ahead of Tomorrow*

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**PLUMBING PRODUCTS DIVISION • ERIE, PA. U. S. A.**

ZURN INDUSTRIES, INC.
Plumbing Products Division
Erie, Pa. U.S.A.

Please send me your new free Manual 60 describing the complete line of modern-engineered ZURN THINLINE SYSTEMS . . . and Form 24-ADV **INDEX** for all manufacturers' fixtures.

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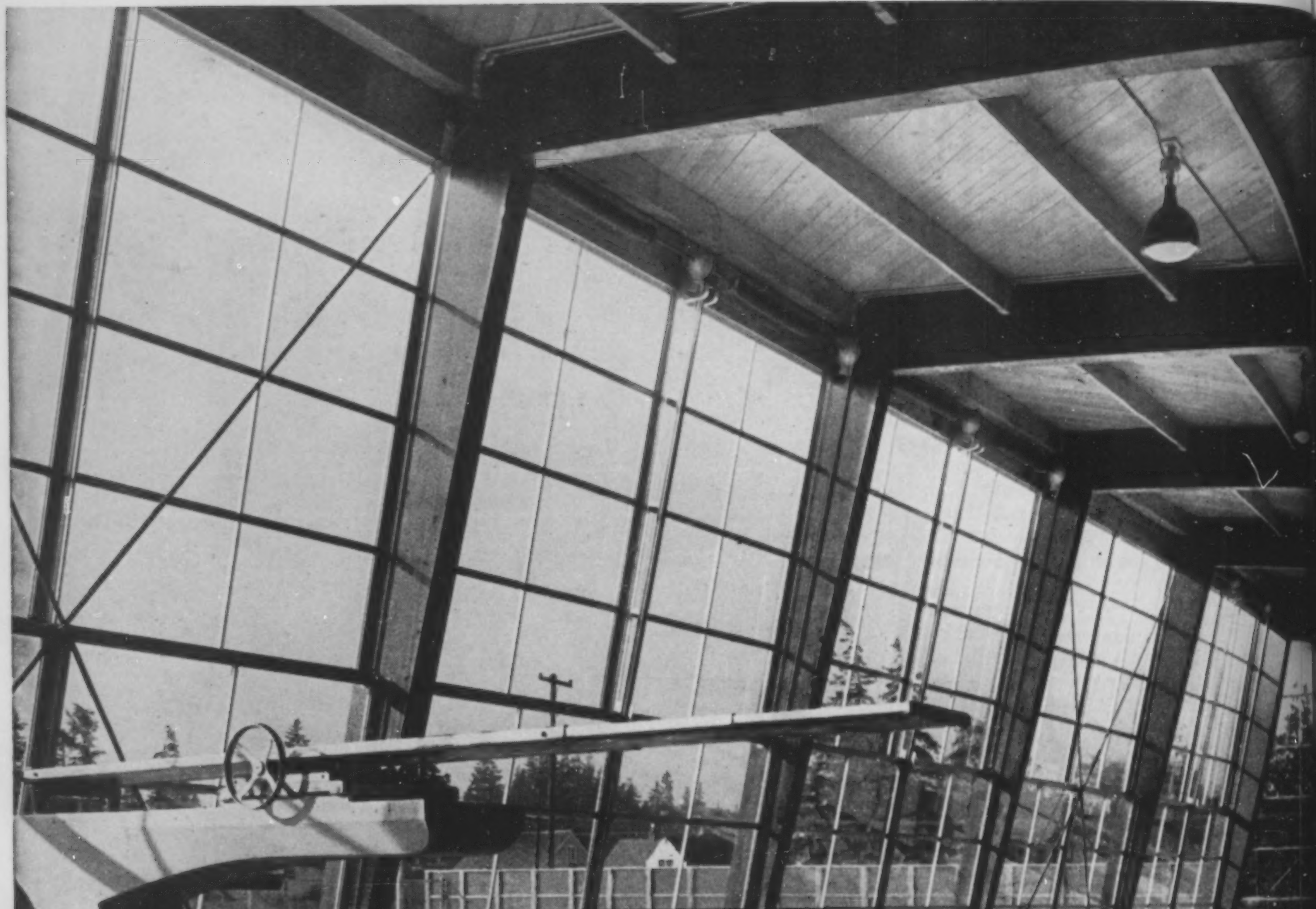
AF-1

# $350,000 INDOOR-OUTDOOR POOL



# OL in OREGON CREATED with

THE "OVERHEAD DOOR" TRADE MARK

# PANORAMIC Aluminum Door

*Eight sets of upward-acting Panoramic aluminum doors —plus sixteen sets of matching aluminum-and-glass panels —are combined to make the West's newest pool!*

Utilizing the unique design and construction advantages of The "OVERHEAD DOOR" Panoramic Aluminum Door to the fullest extent, Stevenson and Thompson have produced this outstanding swimming pool with the protection of an *indoor* pool . . . the free-and-easy aspects of an *outdoor* pool. At a flick of the wrist, each of The "OVERHEAD DOOR" Panoramic Aluminum Doors can be raised to let in the out-of-doors . . . or lowered to guard against weather!

The construction of The "OVERHEAD DOOR" Panoramic permits stiles and rails to be narrower yet far stronger than ever before. The clean, modern lines—and the clear glass panels—make the Panoramic suitable for the smartest installations. Little wonder, then, that The "OVERHEAD DOOR" Panoramic is being specified by more and more architects throughout the nation.

For 37 years, architects have specified The "OVERHEAD DOOR" more than any other brand!

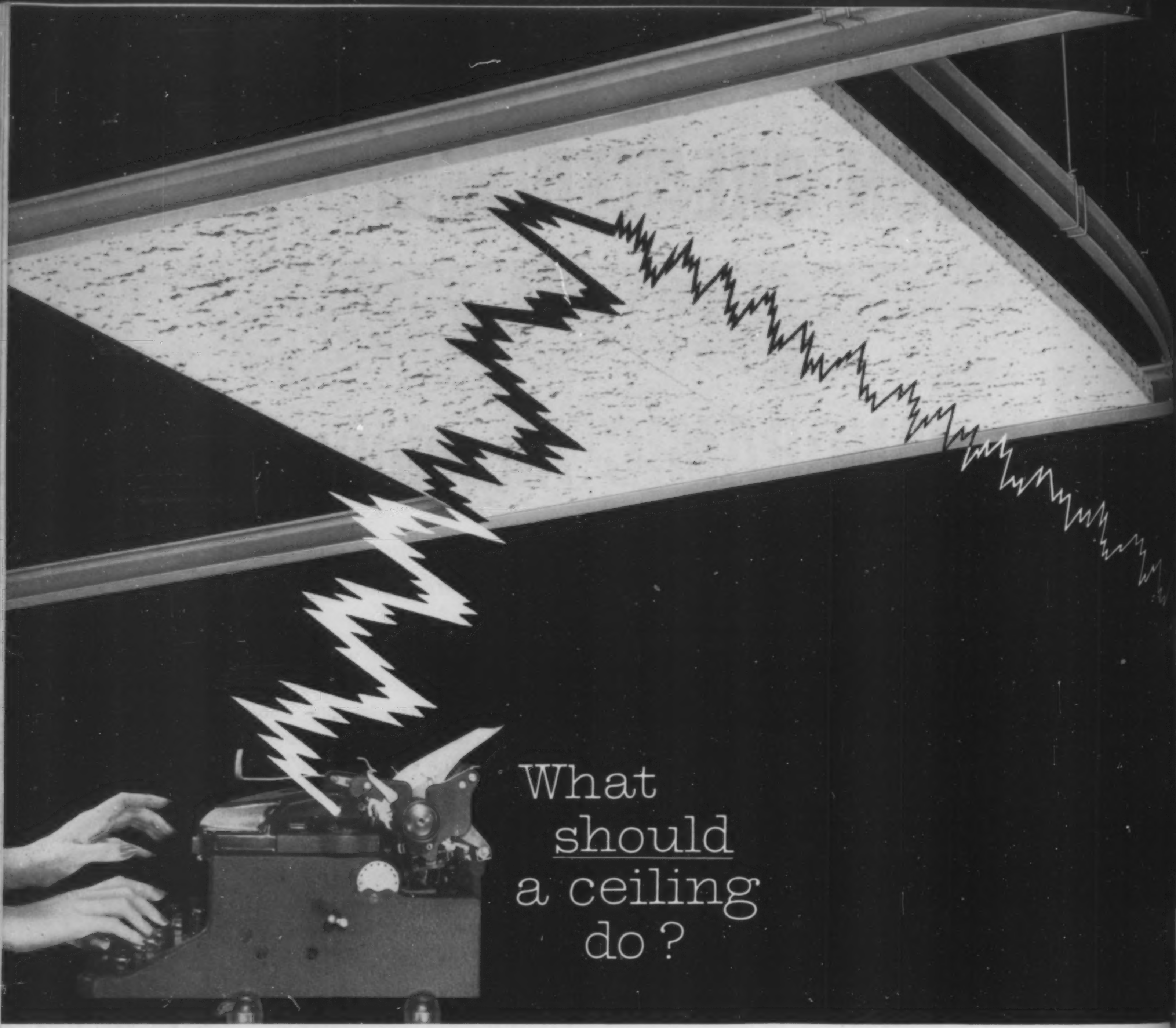
**OVERHEAD DOOR CORPORATION**

*General Offices: Hartford City, Indiana • Manufacturing Distributors: Cortland, N. Y.; Hillside, N. J.; Lewistown, Pa.; Marion, Ohio; Nashua, N. H. • Manufacturing Divisions: Dallas, Tex.; Portland, Ore. • In Canada: Oakville, Ontario*

© 1958, O.D.C.

Exterior view of pool at North Bend, Oregon, shows the smart, modern lines created with The "OVERHEAD DOOR" Panoramic. Architect—Gordon Trapp; Engineers—Stevenson and Thompson; Contractor—A. T. Fox.

Photo above shows one of the many installations of The "OVERHEAD DOOR" Panoramic Aluminum Doors at Lee Terminal, Standiford Field, Louisville, Ky. Architects Arrasmith and Tyler utilized the attractive, lightweight Panoramic Aluminum Doors to combine modern beauty with fast, easy operation throughout the terminal.



## sound absorption *is one of the* 7 functions *of a modern ceiling*

- structure
- **sound absorption**
- sound isolation
- fire protection
- beauty
- comfort
- economy

To eliminate "unwanted sound" and to control "wanted sound" are functions of good ceiling construction. Reducing high sound levels and eliminating annoying sound reflections can be accomplished by using ACOUSTONE Mineral Acoustical Tile.

ACOUSTONE suspended with U.S.G.'s E-Z-S System is pictured here. This system is one of several U.S.G. Sound Control Ceiling Systems specially designed to provide practical solutions to a wide variety of sound problems.

For a free showing of "More than Meets the Eye," U.S.G.'s 16 mm color sound film about good ceiling construction, contact your nearby ACOUSTONE Tile Contractor or write Dept. AF-82, 300 W. Adams St., Chicago 6, Ill. Additional information in Sweet's Catalog, Section 11a/Uni.

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MINERAL ACOUSTICAL TILE
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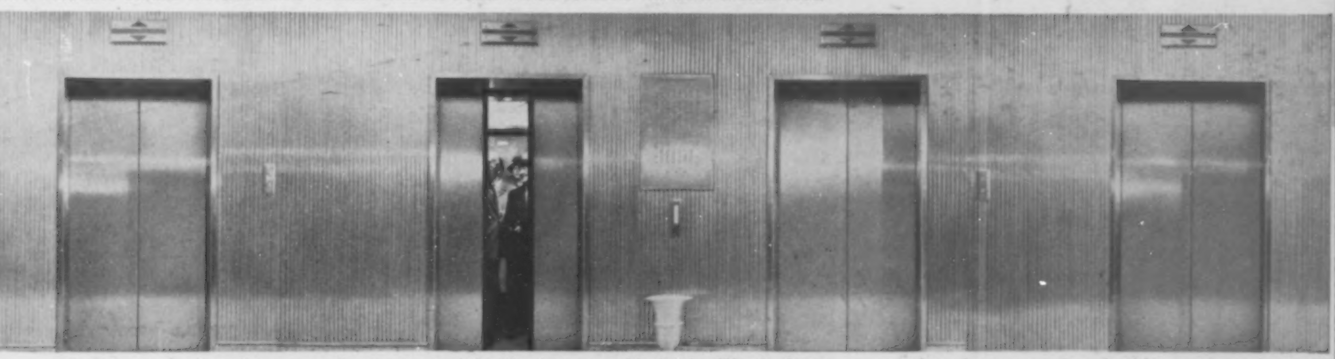
UNITED STATES GYPSUM
The greatest name in building

*SOUND CONTROL IS*
*A JOB FOR EXPERTS*

Mr. H. Walter Graves, Vice President of Albert M. Greenfield & Co., Inc., management agents, explains Traffic Sentinel® door operation to prospective tenant. Doors stay open wide to allow passengers to enter elevator.

Mr. Graves stresses the fact that elevator doors begin to close only after the *last* passenger has boarded the elevator. None of the passengers was "threatened" by a premature door closing.

Here, Mr. Graves demonstrates how closing elevator doors will reopen instantly when a passenger crosses the threshold and breaks the electronic Traffic Sentinel beam which controls the door mechanism.



Mr. Graves invites the prospective tenant to join him in a test ride in the Westinghouse *operatorless* elevator equipped with Traffic Sentinel controlled doors. Notice how elevator doors close quickly after last passenger has entered.

# MANAGEMENT V.P. USES "SHOW" BUSINESS

## TO DEMONSTRATE WESTINGHOUSE TRAFFIC SENTINEL® ON OPERATORLESS ELEVATORS

*Architects: Thalheimer & Weitz*

**PENNSYLVANIA LUMBERMENS MUTUAL INSURANCE BUILDING** is a completely reconstructed office building, offering every modern convenience to its tenants. When in Philadelphia, treat yourself to a luxury test ride in the newly installed Westinghouse *operatorless* elevators equipped with Traffic Sentinel controlled doors.

J-98759AA

The Pennsylvania Lumbermens Mutual Insurance Building in Philadelphia is an excellent example of what remodeling and modernization can do for well-constructed, well-designed buildings.

The former 12-floor, 200-room Ritz-Carlton Hotel was converted into an up-to-date 17-story office building. Included in this major modernization program is a bank of six high speed Westinghouse *operatorless* elevators equipped with Traffic Sentinel controlled doors. These elevators, together with "magic" Traffic Sentinel doors, provide the finest and fastest in vertical transportation. Passengers are moved quickly and safely to their desired floors. There is no undue waiting . . . no unnecessary loss of floor-to-floor time. Here is passenger convenience and service at its best. Existing buildings need it to compete with new buildings—and prospective tenants are demanding it, more and more.

If you are planning to modernize your present elevator system to meet today's heavier passenger traffic demands, the people to talk with are in your nearest Westinghouse Elevator Division office. They'll help you with any elevatoring problem relating to modernization or new building installations.

**YOU CAN BE SURE...IF IT'S**

**Westinghouse**

**WESTINGHOUSE ELEVATORS AND ELECTRIC STAIRWAYS**

## People who think big* are thinking of

# MULTICOLOR LACQUER ENAMEL

*for example, Great Southwest Corporation, Dallas/Fort Worth

Midway between Fort Worth and Dallas the Great Southwest Corporation is developing a multimillion dollar 5,000-acre industrial "dream" project. With 900 acres currently under development, it is expected that 10 years will be required for the construction of this widely publicized industrial city.

To carry out the modern forward-looking appearance, multicolor lacquer enamel has been selected by the architect for the exterior of all masonry surfaces. From coast to coast, architects and building managers have been finding that multicolor is one sure way to keep construction "like new" for years ahead.

Requiring only normal techniques and equipment, multicolor lacquer enamel permits the simultaneous spraying of two or more colors on a surface as a single finishing coat. Almost any combination of surfaces—concrete, plaster, canvas, wood, wallboard, many plastics and metals—can be merged into an attractive, eye-appealing area with this new type of coating. Multicolor lacquer is a proven design tool for the architect. And these multicolor lacquer enamels are economical to use, easy to maintain.

Hercules Powder Company does not make finished lacquers or coatings of any kind. If, however, you have difficulty securing adequate information on multicolor lacquer enamels, write us and we will be glad to assist.

*This advertisement is one of a series prepared to explain the suitability of multicolor lacquer enamels for a wide variety of architectural applications.*

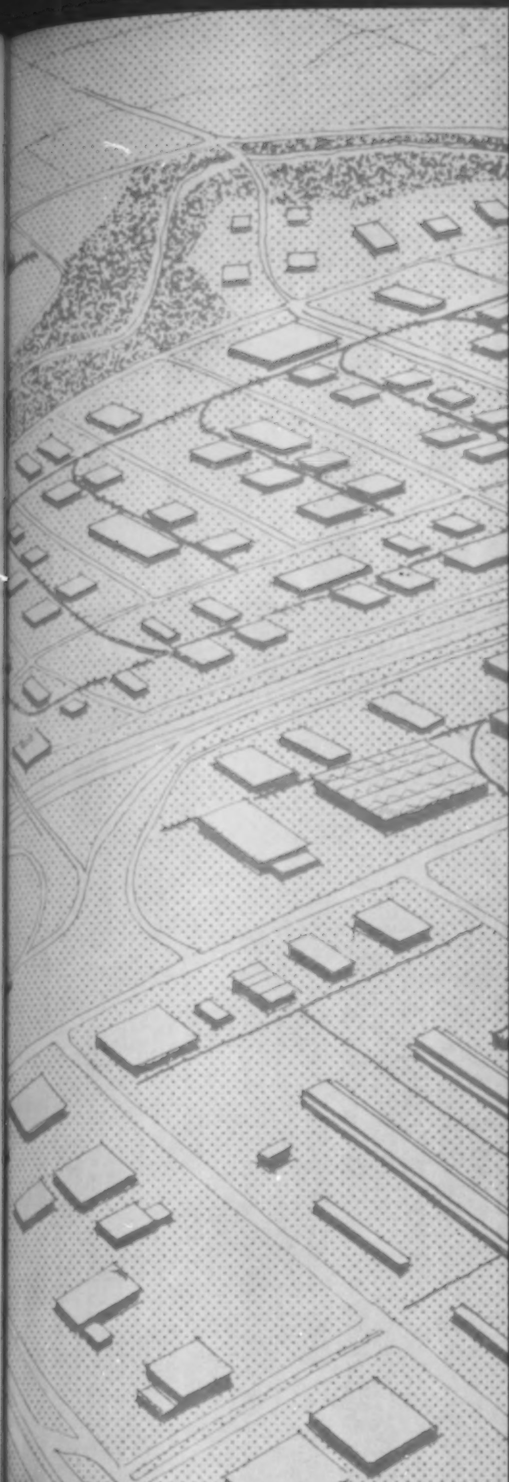
Multicolor lacquer enamel is manufactured under license from Coloramic Coatings, Inc., Los Angeles (U. S. Patent No. 2,591,904).

*HERCULES POWDER COMPANY*
INCORPORATED
*Cellulose Products Department • 900 Market Street, Wilmington 99, Delaware*
**CHEMICAL MATERIALS FOR INDUSTRY**

CL58-2

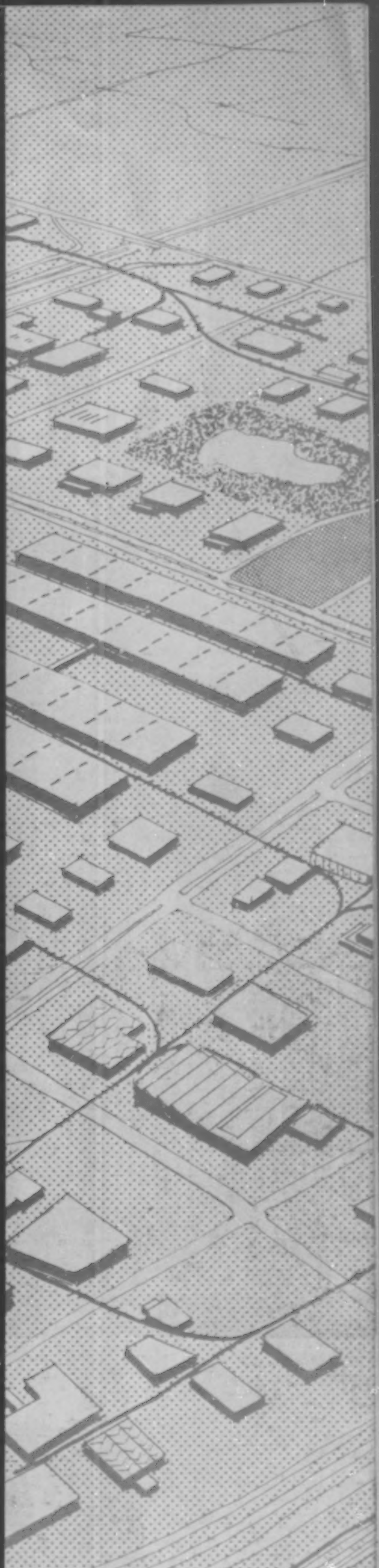
SARGENT - SOWELL, INC.

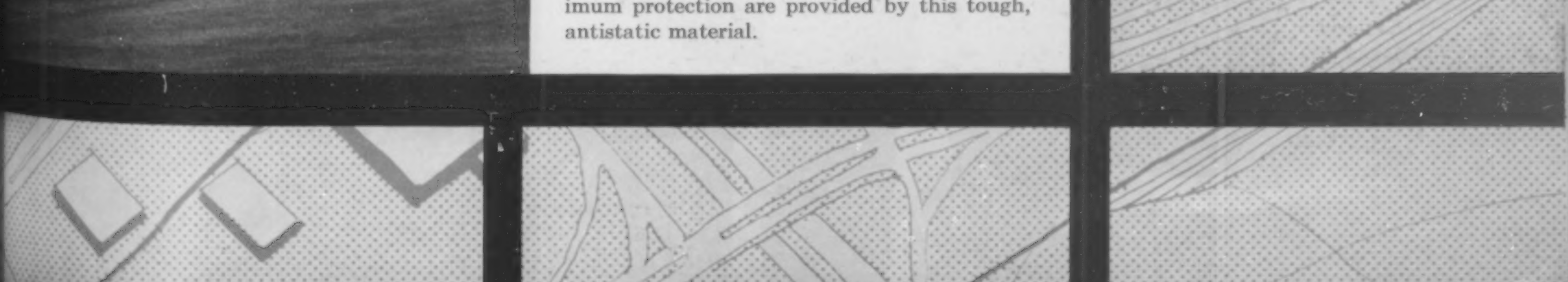
**THE FIRST**—This 15,000-square-foot industrial building is the first to be completed in the new Texas project. Multicolor lacquer enamel for exterior and interior surfaces was supplied by Texas Coatings, Dallas, from the Dallas plant of Western States Lacquer Corporation of Los Angeles.



**EXTERIOR CLOSE-UP**—The attractive and intricate pattern provided by multicolor lacquer enamel is indicated in this view of an exterior wall of the new Sargent-Sowell building in the fabulous Great Southwest Industrial District.

**INTERIOR, TOO**—Multicolor lacquer enamel is ideally suited for interior surfaces where decorative hiding power is desired. Superior hiding of surface imperfections and maximum protection are provided by this tough, antistatic material.





CHICAGO SUN-TIMES

# KEYWALL

GALVANIZED MASONRY JOINT REINFORCEMENT

The Chicago Sun-Times Building contains newspaper offices, printing facilities and rented office space. Architects: Naess and Murphy. General Contractor: George A. Fuller Company.

**Masons like to use Keywall.** It easily unrolls in place on the wall. It's easy to lap at corners without adding thickness to the joint. Mortar flows readily in, under and around Keywall to give full embedment and a complete bond. Masons find Keywall easy to handle on the scaffold.

Keywall is made for the following wall thicknesses: 4″, 6″, 8″, 10″ and 12″.

# the reinforcement that does what masonry joint reinforcement is supposed to do..fights cracks!

Resistance to stresses that cause cracking is a basic purpose of masonry joint reinforcement. While it does increase the ultimate lateral strength of masonry walls, architects and builders depend on masonry joint reinforcement mainly to eliminate damaging and unsightly cracks caused by shrinkage during curing and aging.

The basic multi-directional design of Keywall assures superior resistance to cracks. This has been demonstrated repeatedly on jobs from coast to coast. The new Chicago Sun-Times building is just one example.

Keywall-reinforced walls in the new Sun-Times building show far greater resistance to cracks than comparable walls with other masonry reinforcements, extensive studies reveal. Keywall was used to reinforce exterior masonry backup walls and interior partition walls of the Sun-Times building.

## KEYSTONE STEEL & WIRE COMPANY

**Peoria 7, Illinois**

Keycorner • Keybead • Keywall • Keymesh • Welded Wire Fabric

Department AF-58
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NEPCODUCT
. . . THE UNDERFLOOR
RACEWAY FOR ELECTRICAL
FLEXIBILITY

# Anticipate electrical expansion . . .
# Cut the cost of future changes now with NEPCODUCT

The time to plan for future alterations and expansion of electrical distribution is now—before the floors are in.

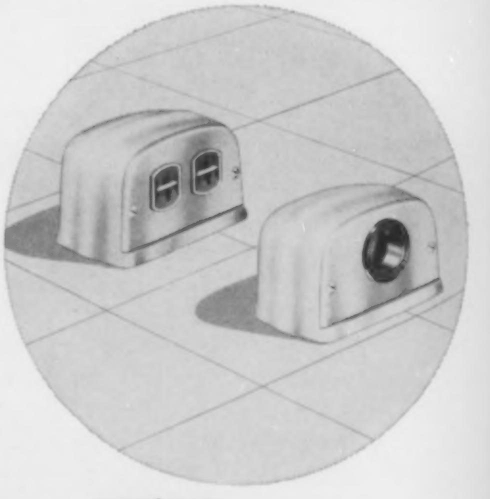
The system that assures these changes can be made conveniently and economically is Nepcoduct—the steel underfloor raceway that makes outlets available at the floor surface wherever and whenever the owner needs them.

With Nepcoduct, future changes in electrical distribution can be made without routing concrete or cutting building structure—without interrupting business operations.

By specifying Nepcoduct, you assure quick, low cost installation in any type floor construction. Nepcoduct can be used as a single, double or triple duct system to provide separate wiring facilities for light and power, inter-communication and telephone. To cut maintenance costs, electrical service is made easily accessible in one junction box through a common hand-hole opening.

To add to Nepcoduct convenience and economy, National Electric offers new service fittings that cut installation time with a simplified one-piece housing. Fittings are especially designed for distribution where modern desks and free-standing equipment restrict the height of service fittings.

Write today for information on Nepcoduct Electrical Raceway Systems.



*Listed by Underwriters' Laboratories, Inc.*

**National Electric Products**

PITTSBURGH, PA.

4 Plants • 12 Warehouses • 41 Sales Offices

In Canada, Nepco of Canada, Ltd.

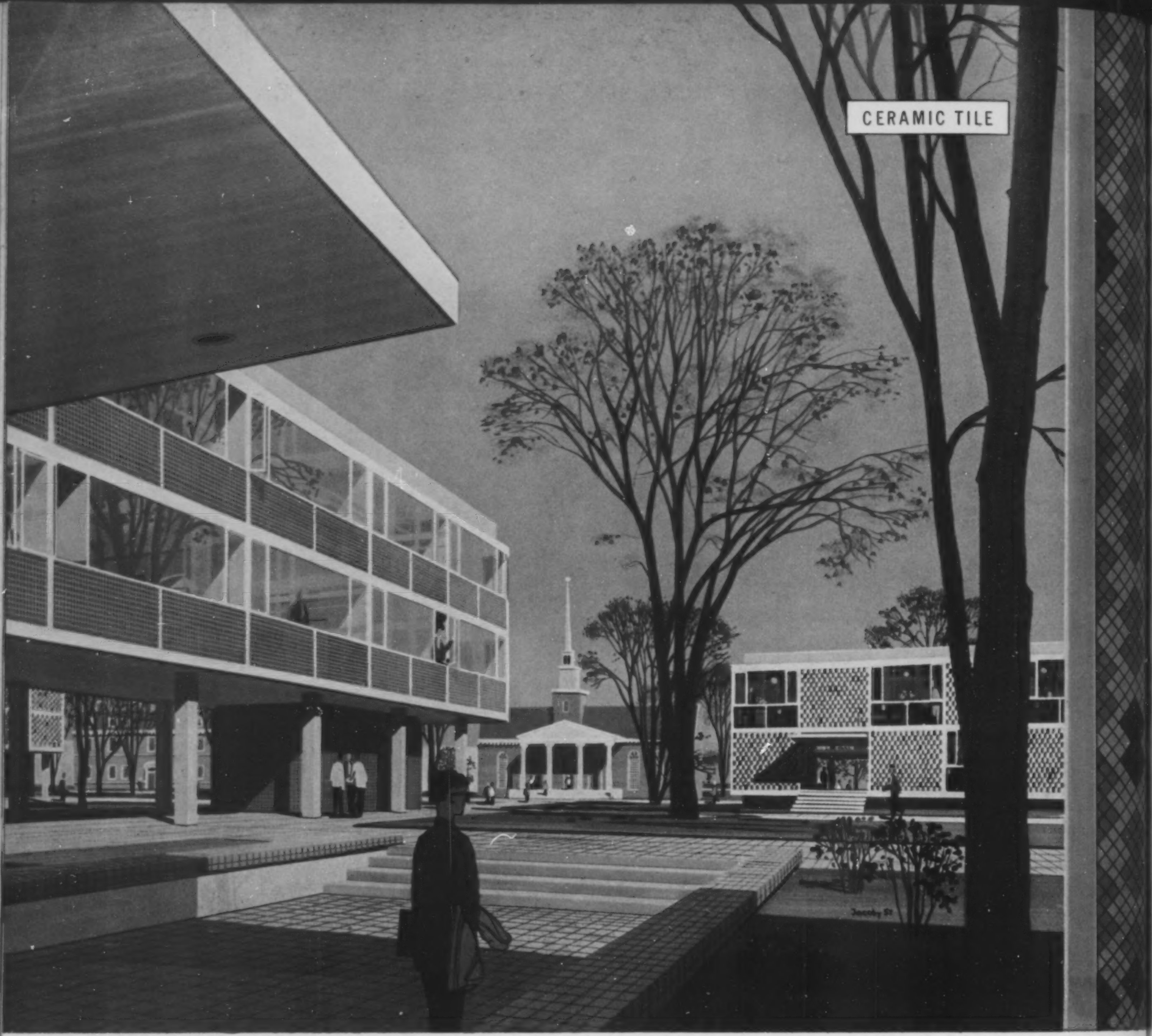
*Composition in Vertical Planes…*

**HAUSERMAN**
**MOVABLE WALLS OF**
**REYNOLDS ALUMINUM**

Now interior walls become the very materials of freely conceived design…as Hauserman and Reynolds use *aluminum* to widen creative scope. Aluminum panels afford new texture effects, in any color. And aluminum extrusions, key to this wall system, add immense variety…joining the movable wall sections with trim, narrow beads or wide posts brilliantly color-anodized. Enjoy this freedom of design, plus the basic advantages of a Hauserman installation: earlier occupancy, lowest maintenance, lifetime service. Write for literature. Or consult the Yellow Pages (under PARTITIONS) and call your nearby Hauserman representative. The E. F. HAUSERMAN COMPANY, 6815 Grant Ave., Cleveland 5, Ohio. Hauserman of Canada, Ltd., Toronto, Ontario.

Watch Reynolds All-Family Television Program "DISNEYLAND", ABC-TV.

The Finest Products
Made with Aluminum
are made with
REYNOLDS ALUMINUM



## "CERAMIC TILE...COLORFUL...A VERSATILE, PERMANENT SURFACE"

KETCHUM, GINÁ & SHARP

per JSS.

This Ketchum, Giná & Sharp design for a college campus is a striking example of modern architecture's mating of beauty and function . . . with broad walks and an open feeling for the dignified handling of today's thronging student bodies. Ceramic tile in varied colors and units helped the architects achieve permanent, uniquely designed exterior surfaces.

Ketchum, Giná & Sharp wove flexible ceramic tile into areas where handsome focal points were indicated . . . flat planes or columns where subdued, one-tone colors were needed . . . and walks where sturdy ceramic tile units paved the surfaces and topped the copings.

Any educational institution would be glad to get ceramic tile's other long-range benefits, too: walls needing no upkeep or replacement, walks which will stand up indefinitely under heavy student traffic, and fireproof surfaces wherever ceramic tile is used.

*The Modern Style*

CERAMIC TILE

*Design for a Modern College Campus by Ketchum, Giná & Sharp*

The multiple benefits of ceramic tile will pay off handsomely for yourself and your client on any residential, institutional or commercial project you undertake. See your local tile contractor for up-to-date information—including all the details on the new lower-cost installation methods and the new dry-curing, thin-setting bed mortars.

PARTICIPATING COMPANIES

American Encaustic Tiling Co., Inc.
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CERAMIC
tile

# What other people are saying

## ARCHITECTS A.D. 2008

*Unless architects plan now for the future, the future will hold no place for them. This is the prediction of Architect Peter Van Bloem in a recent issue of the* Oculus *published by the New York City Chapter of the AIA.*

It is the year 2008. To a man of the twentieth century, the twenty-first century looks like a wonder world. Complete mechanization, electronics, and superefficiency; the ultimate in engineering feats have been reached.

What do architects do for a living? We have no architects now. Many years ago they had a duty to perform. They were to plan for the future. They called themselves planners. Creativity and art were being replaced by conformity and mechanization. Scientists and engineers told them that any conceivable combination of ideas, color, space, and materials could be found mathematically and become something that can be made by machines. It is easy to put two thoughts together and analyze them by machine. Architects found that anything creative not falling within that pattern was too expensive. Today things are made by machine or they are not made at all. Art is more trouble than it is worth. The architects while capitulating to the headlong rush of the masses to the sterile efficiency of today became extinct. They did not stand by to fight for human values against economy and conformity.

## MONEY FOR RENEWAL

*In describing the rebuilding of downtown Pittsburgh to the recent convention of the Associated General Contractors, Park H. Martin, executive director of the Allegheny Conference on Community Development, reported the high costs—and higher profits—of the city's renaissance.*

Approximately $600 million have been spent in what we regard as "The Program."

What has all of this meant to the city's tax base? This is a good question because in Gateway Center and Point Park and in the Lower Hill more than 200 buildings have been torn down, as well as demolition for our parking garages. Here are the facts.

In 1936 Pittsburgh reached an all-time high of $1,211 million of assessed value for tax purposes; by 1947 this had fallen to $961 million. For the year 1957 the Tax Board certified a taxable value of $1,179 million, a gain of $218 million for the city. In the Triangle alone, the assessed value which was $250 million in 1947 has risen as of 1957 to $305 million. Prior to 1947 the sale price of property in the Triangle averaged about 15 per cent below the assessed value; since 1947 it has averaged about 20 per cent above the assessed value.

Beyond the dollars, however, is the fact that the Triangle has been saved. Today it is as attractive a central business district as one can find in the U.S.A. But even beyond all of this the people of Pittsburgh have been redeveloped and now are proud of and believe in their city.

## AN AUTO FOR THE CITY

*The big, fast, long-range gasoline car has so changed cities that there is now a need for the small, slow, short-range electric car. This was one of the conclusions reached by Aarre K. Lahti, Uolevi L. Lahti, and Charles Harris of the College of Architecture of the University of Michigan, in a paper prepared for the 75th Anniversary Meeting of the Society of Automotive Engineers.*

As a society becomes less primitive, the interests of its members become more diverse and their tools, equipment, and transportation devices become more specialized and numerous. This means a proportionately greater increase in multiple-car-owning families, an increase greater than that accountable to the increase in population. Our way of living, our decentralized cities and industries, will make multiple-car ownership mandatory.

Cars today do not fulfill the present needs of two-car families, and they would be completely inadequate for the future. On the one hand they are too small for the leisure-time transportation of large families with increasing gear, and on the other hand they are too large for everyday shopping and commuting. No compromise in a single vehicle is possible; we need two basically different vehicles.

The next decade will see great progress in the harnessing of the unlimited solar energy, and its conversion into electricity. This means a greater use of electricity and suggests that the second car, the shopping-commuting car, be an electric. Incidentally, the torque characteristics of an electric motor are ideal for the intermittent starting and stopping necessary in

*continued on page 172*

The new 1,520,000 sq. ft. Automatic Electric Company plant at Northlake, Ill.—designed, engineered and built by The Austin Co.

78 Stainless Steel Washfountains are located in mezzanine locker-rooms at strategic points throughout the plant.

## Automatic Electric Plant Sets New High Standards in Operation and Design

### —AND IN WASHING FACILITIES, TOO!

A member of the General Telephone System, Automatic Electric has completed their new Northlake, Illinois, plant with the most modern facilities for efficient operation and employee welfare.

### 78 STAINLESS STEEL BRADLEY WASHFOUNTAINS!

Clean locker-rooms, well-lighted and roomy, are located conveniently throughout the plant. Foot-controlled stainless steel Washfountains provide the maximum in sanitary washing facilities—each serving 8 to 10 simultaneously.

There are no faucets to touch or maintain, no chance of spreading infections. Installation time was saved since each multi-person Washfountain requires but three piping connections.

Water consumption is reduced—no water wasted because of foot-control, and maintenance and janitor work are kept to a minimum.

Bradley Washfountains are used in plants of every size and may be installed in old as well as new buildings. For complete data, ask for Catalog 5601.

The foot-controlled sprayhead serves 8 to 10 but the total amount of water is no more than for a conventional wash basin.

BRADLEY WASHFOUNTAIN CO.
2335 W. Michigan St.
Milwaukee 1, Wisconsin

Write for Catalog 5601

**BRADLEY washfountains**

*Distributed Through Plumbing Wholesalers*

city traffic. It is rather ironical in that the very long range automobile, the cause of the electric's oblivion, has so changed our cities and our way of living that the limited range of an electric is no longer inadequate for the second car. This shopping-commuting car need not have a cruising range of more than 35 miles per day; a cruising speed of 25 and a top speed of 35 miles per hour are adequate. Its capacity need not exceed that for two adults and a child, but it must have sufficient space for purchases and family-rearing equipment. The large used car is not the answer to second-car needs; the second car must be economical, small, quiet, smog- and troublefree. This vehicle might very well be a less costly rental car.

It would certainly be a space saver in parking and yet be adequate for a mother and two children and have plenty of room for diapers, folding crib, and purchases. Some may think that a woman wouldn't want to be seen driving in such a small, low-priced car. We don't think we need worry about this, for driving such a car is the surest way of advertising that one is a two-car owner and that there is no question that the family owns a big super-lush job. If everyone is not made aware of this prestige factor, the advertising agencies of the next decade will bear no resemblance to those of today.

### HIGH SPEED PARKS

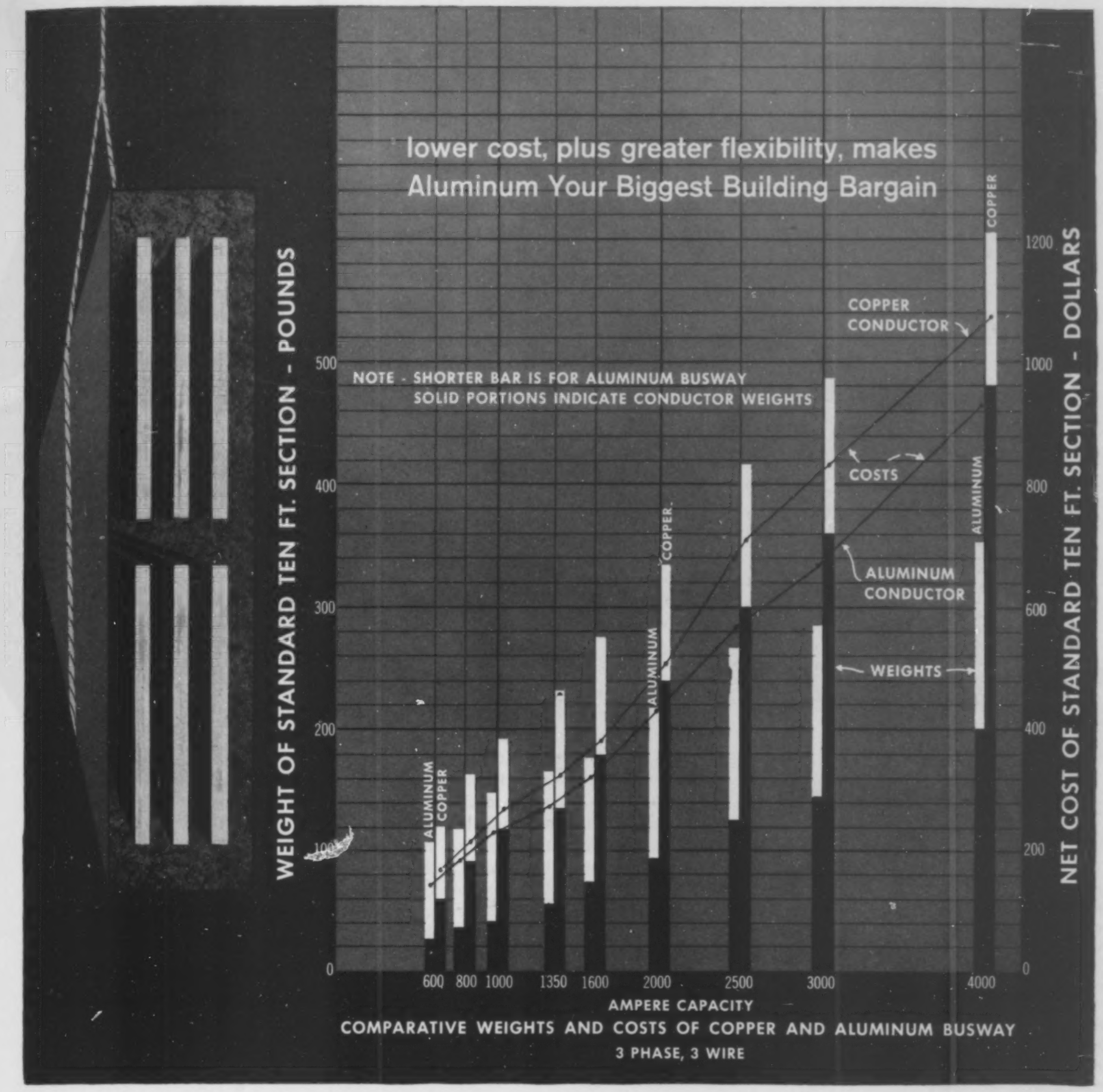
*The modern parkway, viewed at 45 miles per hour, requires a different kind of design than the intimate pedestrian park. This difference is discussed by Lawrence Halprin, San Francisco landscape architect, in a recent issue of the* Wisconsin Architect.

Rapidity of movement can vary experiences in the landscape. This is particularly true in the larger landscape of park and field and street scene and parkway. A walk along winding paths in the city park in continuous but slow movement has an almost hypnotic and soothing effect—the path winds slowly, rising gradually, the walking movement becomes automatic, trees pass, water is first on the left and then on the right, ducks quack, birds sing —it is a scene intimately experienced.

The same experience seen from a car moving through the park at higher speeds calls forth a completely different emphatic response. At 45 miles an hour only the big elements are seen—there is a lake with trees around it, and beyond a grassy field. These are passed in a moment and the next element appears. The park remains the same but the rapidity of the movement through it has changed its appearance for the moving person.

Parkway design must recognize this element of rapidity of movement along its roadbed by a design which is related to the quickly moving person. Long radius

*continued on page 174*



Comparison of initial cost of aluminum busway compared to copper shows aluminum has a price advantage, even in the smallest sizes.

# Aluminum Busway helps reverse trend to higher building costs

Probably no other product used by the building industry can offer savings comparable to aluminum busway: up to 20% on material costs, up to 20% on installation costs and savings in weight permitting the use of less costly busway supports. Aluminum busway requires less space than cable and conduit.

Modern aluminum busway, with lightweight Alcoa® Aluminum Bus Bar, also offers flexibility to meet new and increased power demands. Future loads can be tapped off at any point. Pound for pound, aluminum busway has greater current-carrying capacity at less cost than conventional wiring systems.

When *you* need a modern, flexible distribution system, specify busways made of Alcoa Aluminum . . . and *save*. Aluminum Company of America, 2295-E Alcoa Building, Pittsburgh 19, Pennsylvania.

*Your Guide to the Best in Aluminum Value*

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ALUMINUM
ELECTRICAL CONDUCTORS AND ACCESSORIES
ALUMINUM COMPANY OF AMERICA

"ALCOA THEATRE"
Exciting Adventure
Alternate Monday Evenings

make

**KELLOGG**

KMG

**dial intercoms**

part of
your plans

settle
the question
instantly!

Today, modern management men need facts . . . *fast!* And, KMG internal automatic dial telephone systems provide the consumer benefits your clients want . . . without tying up busy *outside* lines . . . without renting costly telephone company equipment.

KMG systems feature Executive Right-of-Way, automatic "Busy" and "No-Answer" call rotation, Code Call, Voice Paging. All phones are K-500 commercial quality, available in 9 decorator colors. And, KMG systems are designed to grow with your clients' business requirements — 25, 50, 100 or 1000 phones — easily, economically.

Your local Kellogg engineering consultant is a well qualified communications specialist. He will be pleased to work with you at the planning stage — survey your clients' present and future inter-communication and sound needs.

Get acquainted with your Kellogg man today. He's a good man to know.

To get THE facts at your fingertips, write today!

KELLOGG
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**KELLOGG SWITCHBOARD AND SUPPLY CO.**
Commercial Products Division
6650 S. Cicero Avenue, Chicago 38, Illinois

A Division of International Telephone and Telegraph Co.

curves, bold planting in masses, large-scale opening out and closing in of surrounding spaces are important elements in this high-speed design.

The danger, as we all know, is the somnambulistic effect of repetition due to movement. Where lethargy may be a welcome result of a 3-miles-per-hour stroll through a park, it can be dangerous at 55 miles per hour on a parkway. Strong and violent contrast in the landscape may therefore be at times desirable in order to break up the repetitive pattern. The principle of design for movement must therefore take into account not only the moving person, but attempt to prevision the speed at which he will be moving through the spaces of the landscape.

## MODERN ART AND ARCHITECTURE

*The design of pictures and buildings have much in common according to Dean Philip N. Youtz of the College of Architecture and Design at the University of Michigan. His observations were printed in the college's magazine,* Dimension.

The modern artist did not rebel against reality. He revolted against the kind of blindness that comes about when the mind usurps the functions of the eye. He found himself in a society that had long since forgotten how to observe freshly and enjoy first-hand visual experience. So he repudiated this drab conventional world and sought a brilliant new one of his own. Since the scenes about him had grown timeworn and shabby, he looked within, exploring the subjective panorama of his own inner experience. Here he found to his delight and to the annoyance of the literalist a freer realm which he could shape to his own satisfaction. The surprising thing about the new direction taken by modern artists is that so large a public followed them and accepted abstract art.

Somewhat similarly, our contemporary architecture has its roots in the present not in past history. It is not an imitation or a reproduction, but an authentic or original expression of current social needs. Period design has all but disappeared and has been replaced by living design.

What has been gained by this revolution in the arts of design? The gifted artist and architect have found their talents liberated. The mediocre designer, however, has lost the period costume which enabled him to masquerade as a creative architect or artist. Modern work glaringly reveals the artist who leans on the representation of a pleasing scene and the architect who relies on period embellishment. The modern painter or architect must trust to his own talent to produce an acceptable product. In this regard there is not much difference in the requirements for a good painting, sculpture, or building. They each require power of organization and imaginative expression. END

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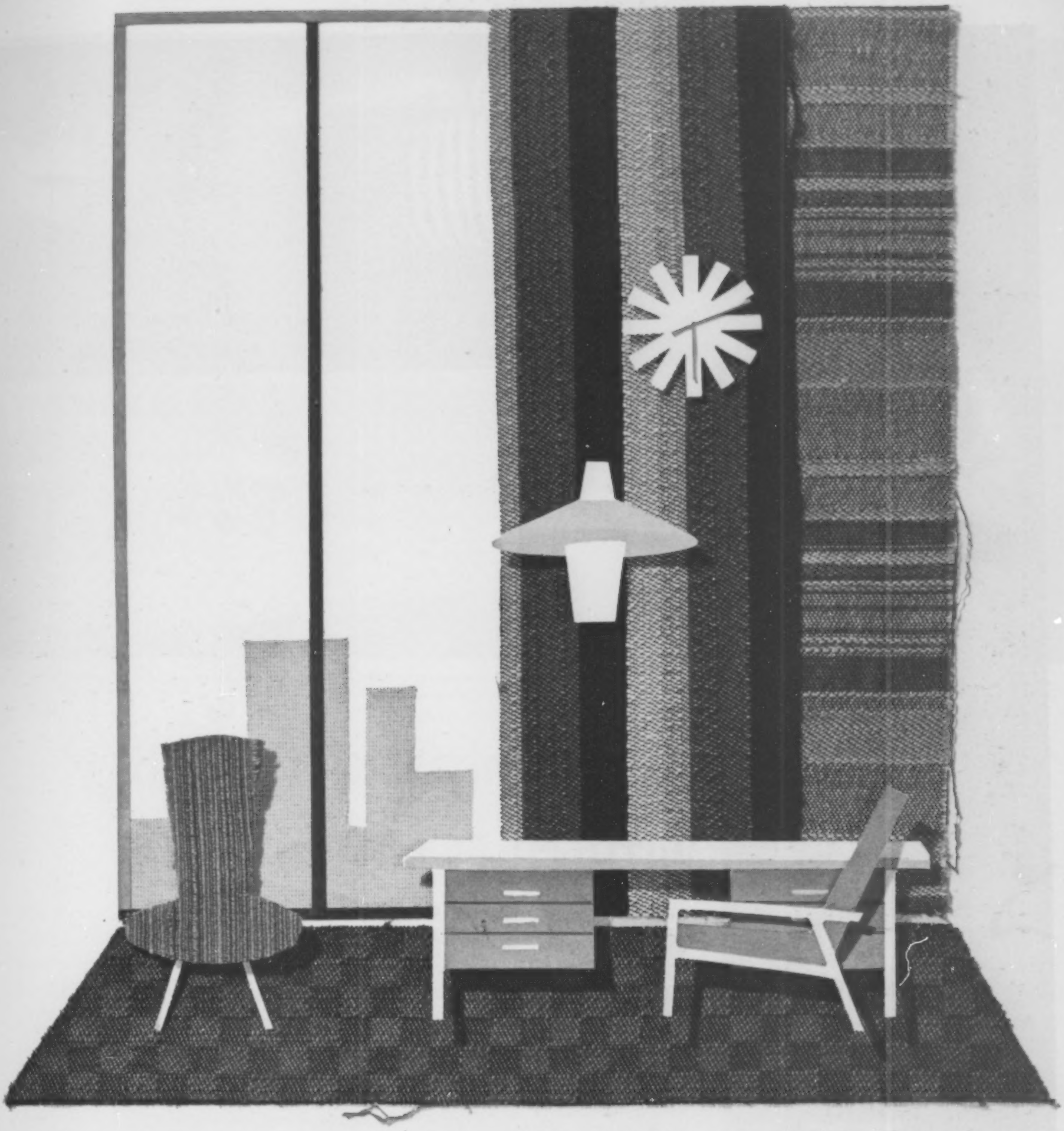

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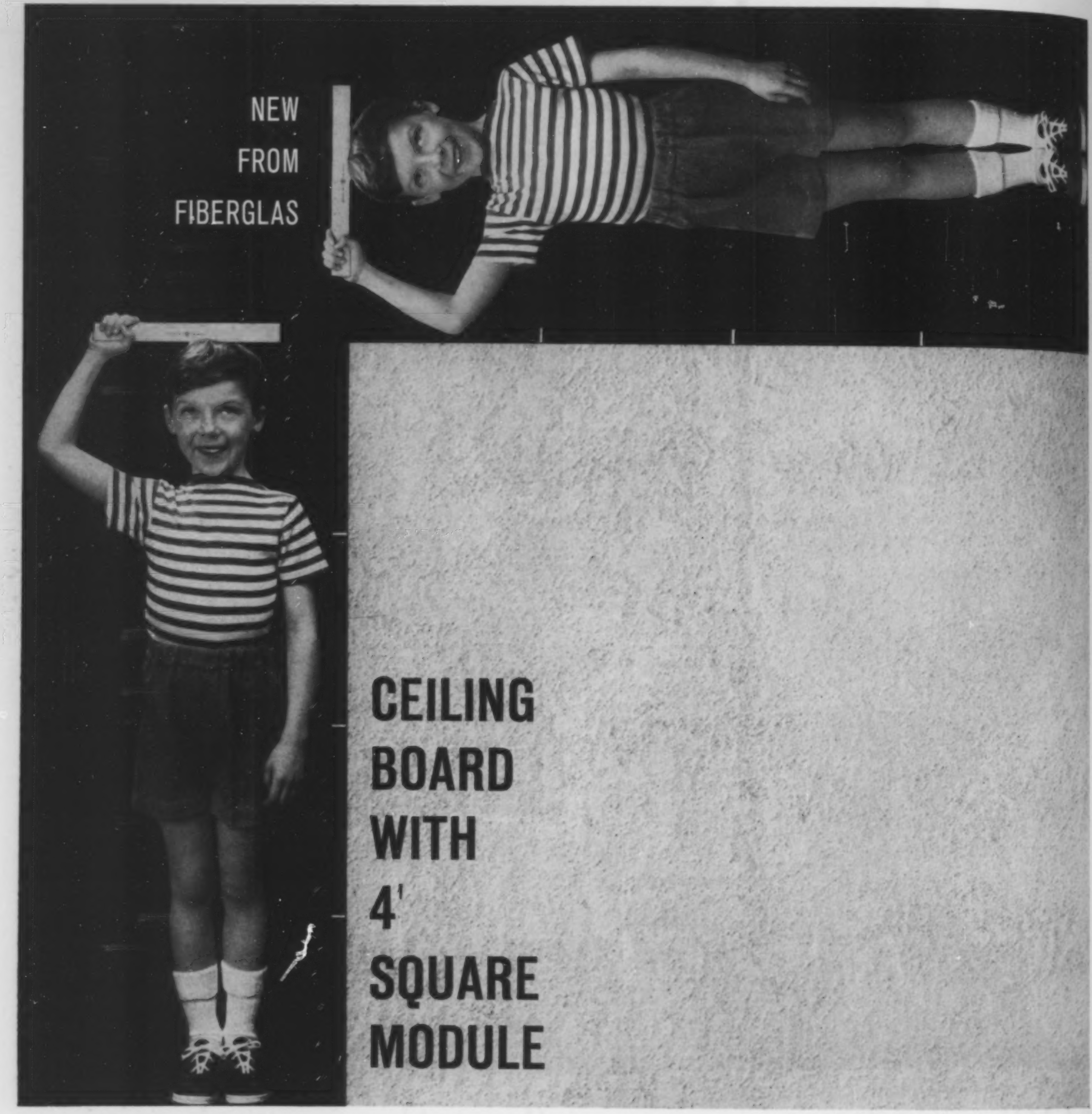

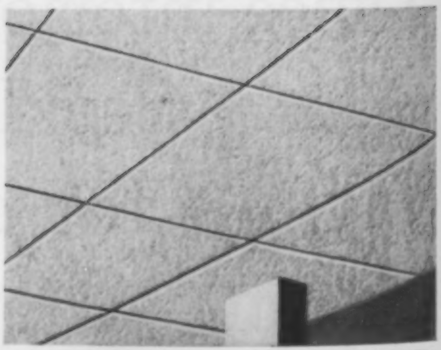

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# Human Engineering guides design of award-winning research center

**The New Engineering Science Center** of the Northrop Division of Northrop Aircraft, Inc., has recently been awarded top honors for beauty and utility of design by the Los Angeles Chapter of A.I.A. It was selected from more than 400 structures entered in this competition. Human engineering was the most important single factor that went into its design. The needs and comfort of the men and women who would work there were taken into consideration and the modular interiors were engineered to meet these needs.

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**In the new Northrop Research Center** are three buildings. The smaller, one-story building in the left foreground is the cafeteria, which is capable of feeding 800 persons every thirty minutes. 150 tons of structural steel were used in its construction. The larger building contains a 6-story administrative tower and a wing which houses an ultramodern drafting room and a computer research center. The drafting room has one of the most extensive "shadow-free" lighted ceilings in the nation. This unit required 1,200 tons of structural steel.

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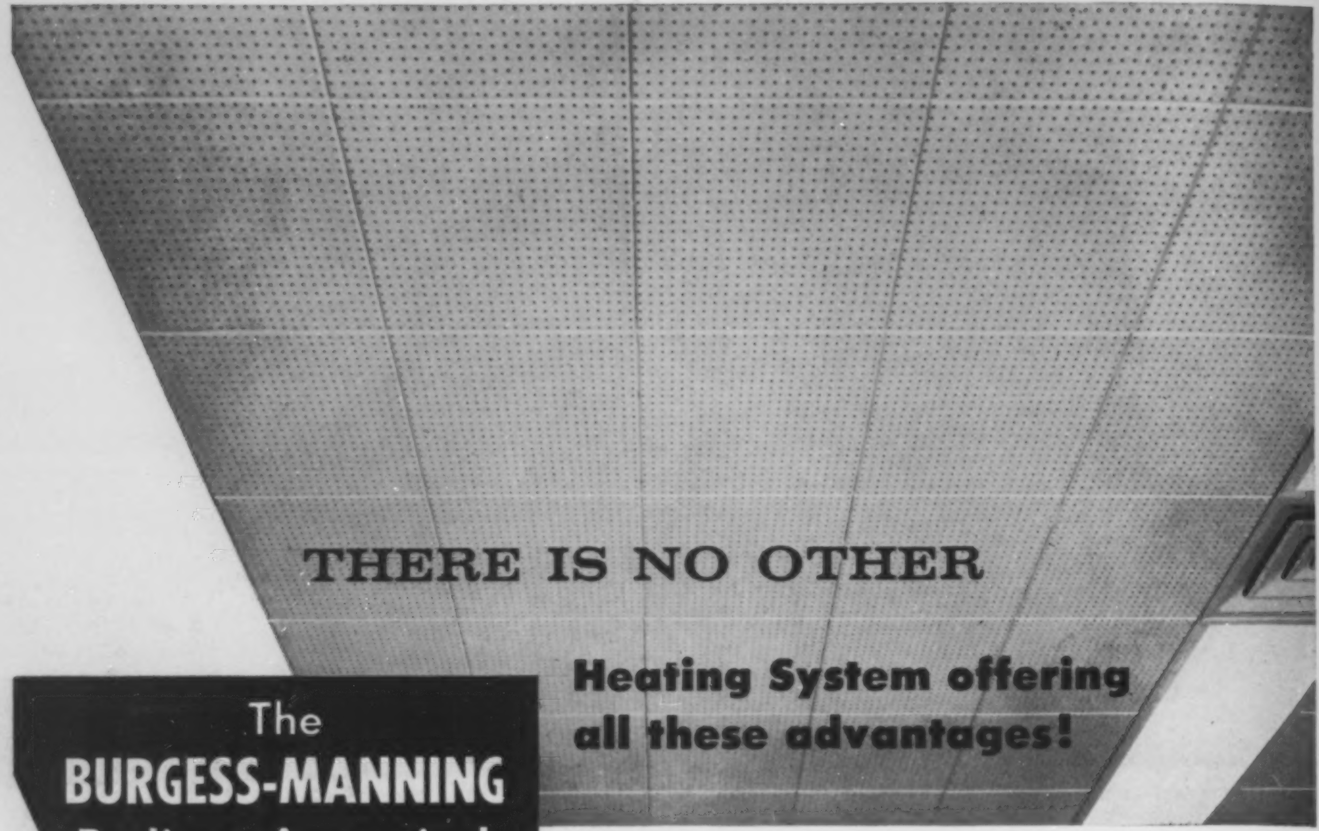

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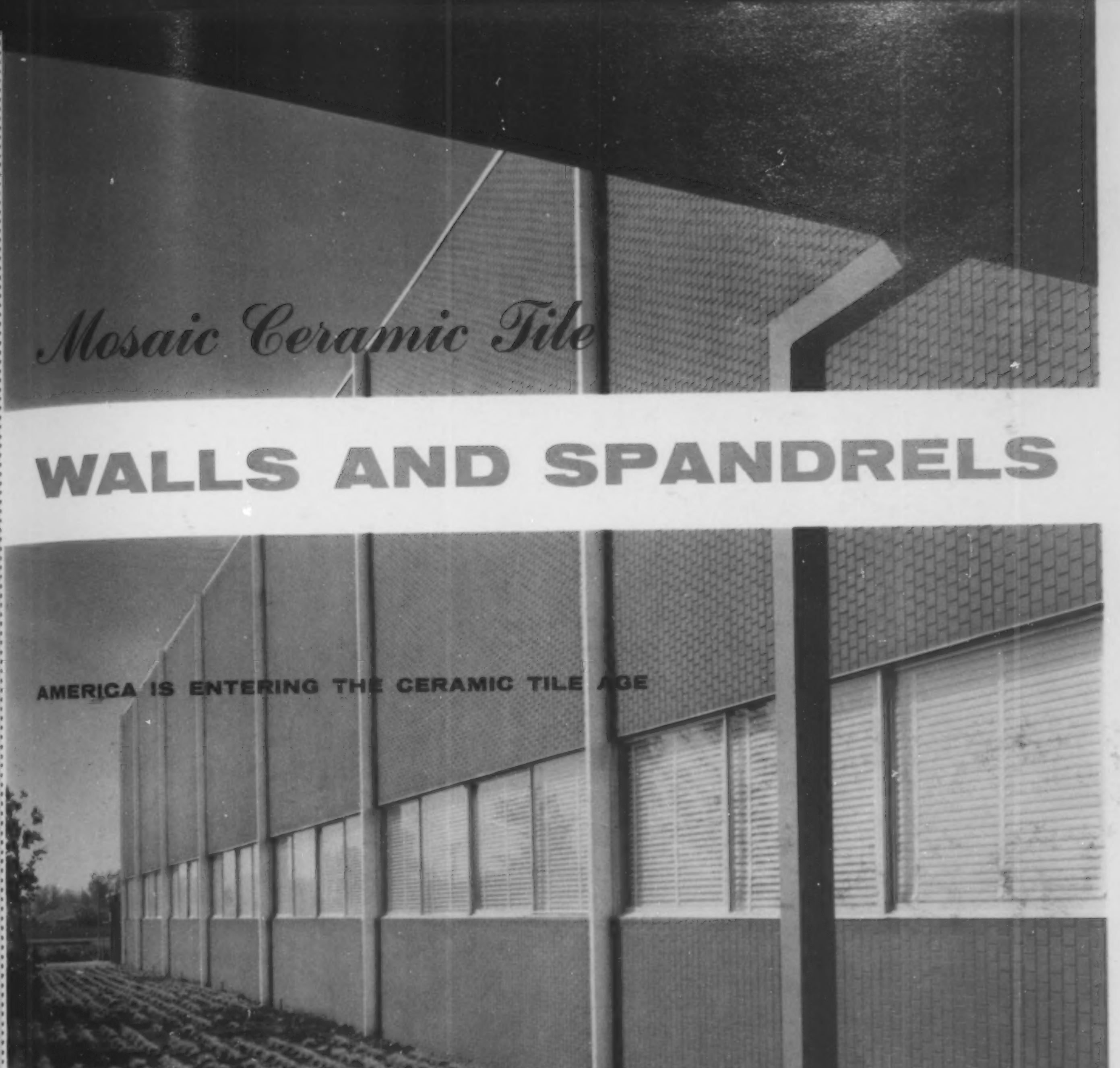

*Mosaic Ceramic Tile*

# WALLS AND SPANDRELS

AMERICA IS ENTERING THE CERAMIC TILE AGE

MOSAIC

Architect: Richard L. Dorman. Tile Contractor: Selectile. Plate No. 603

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CERAMIC TILE WALLS AND SPANDRELS

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THE MOSAIC TILE COMPANY CERAMIC TILE WALLS AND SPANDRELS A.I.A. FILE NO. 23-A

# *Mosaic Ceramic Tile*

## WALLS AND SPANDRELS

*Warmth, enrichment, individuality*

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It is often desirable to enrich this geometry by selecting materials for these surfaces which are rich in color and pattern. This gives human appeal and individuality. Naturally, the materials selected must totally endure weather and wear and must require only minimum maintenance.

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The Mosaic Tile Workbook for Architects, Form No. 226, is in Sweet's. For additional data, write The Mosaic Tile Company, Dept. A, Zanesville, Ohio, or The Mosaic Tile Company, Dept. A, 829 N. Highland Ave., Hollywood 38, California.

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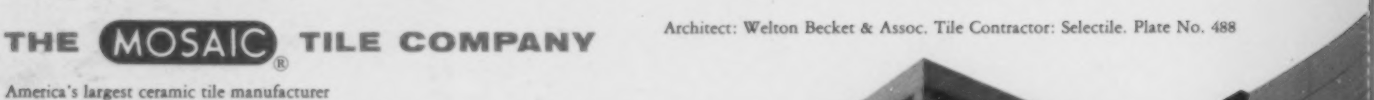
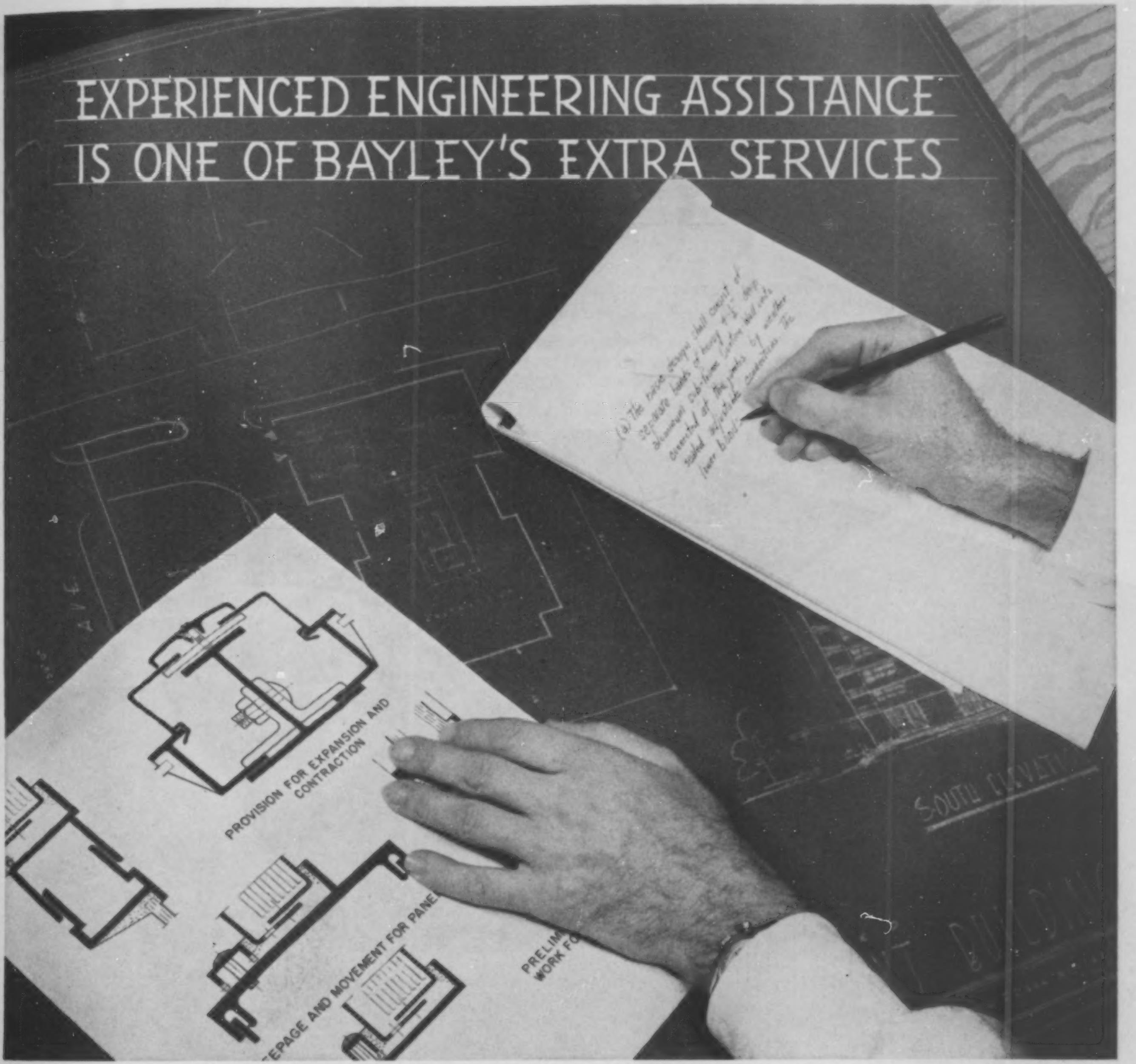
Architect: Welton Becket & Assoc. Tile Contractor: Selectile. Plate No. 488

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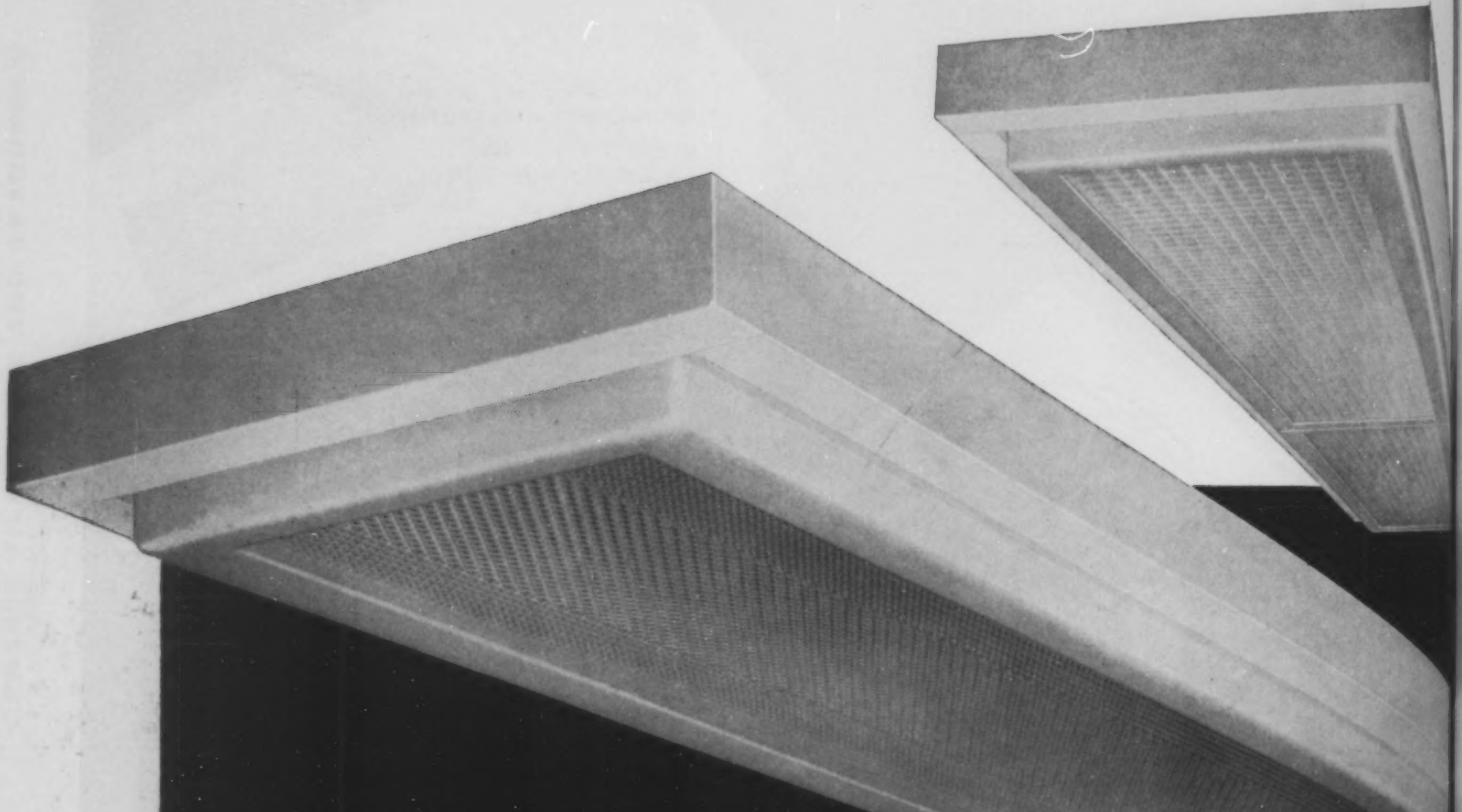

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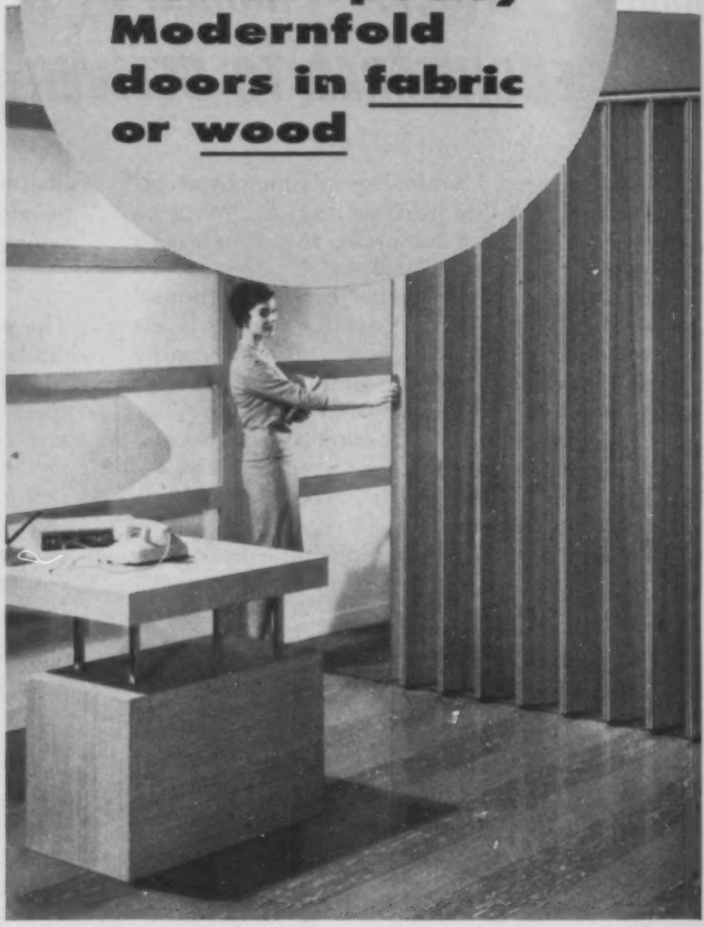

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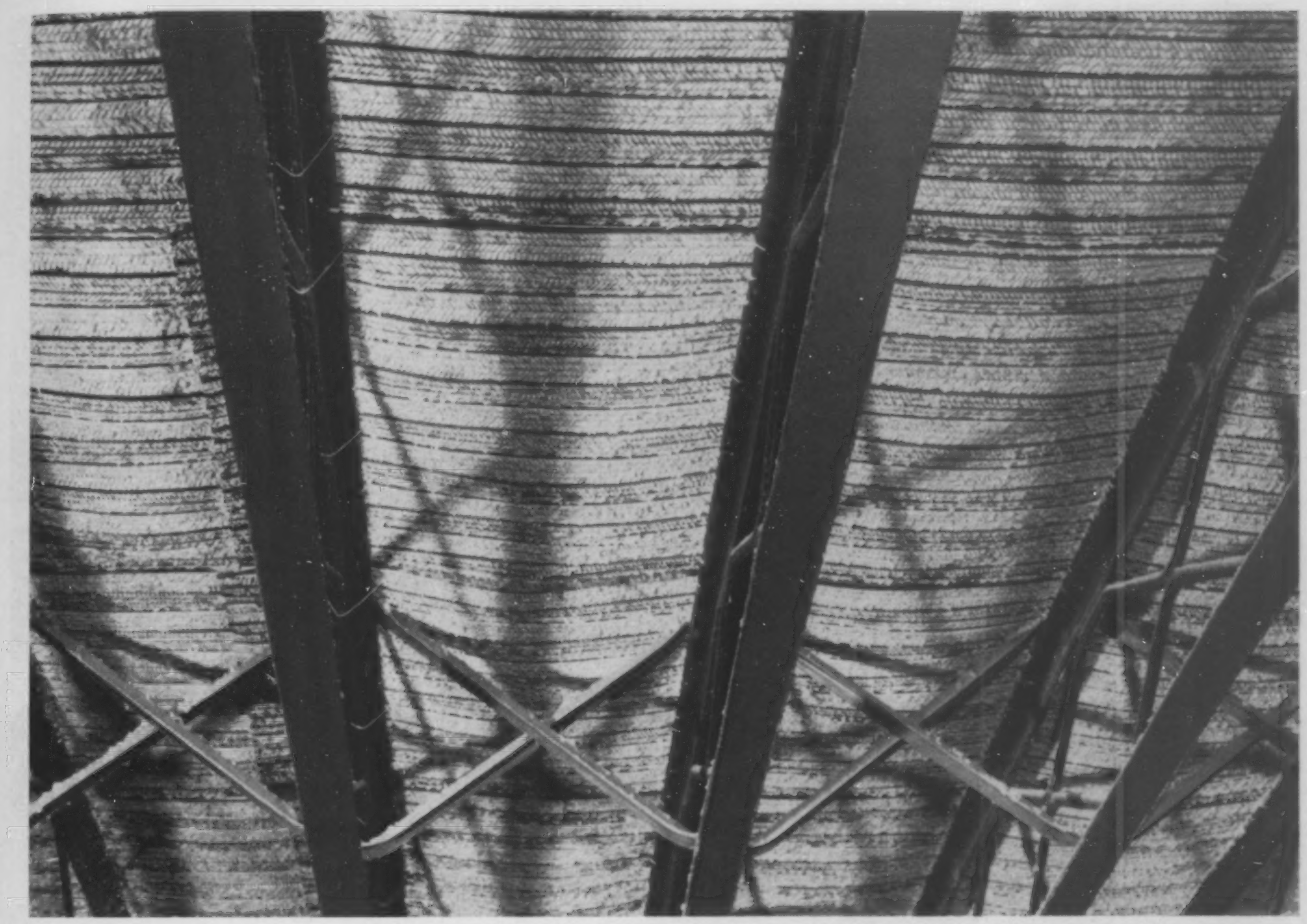

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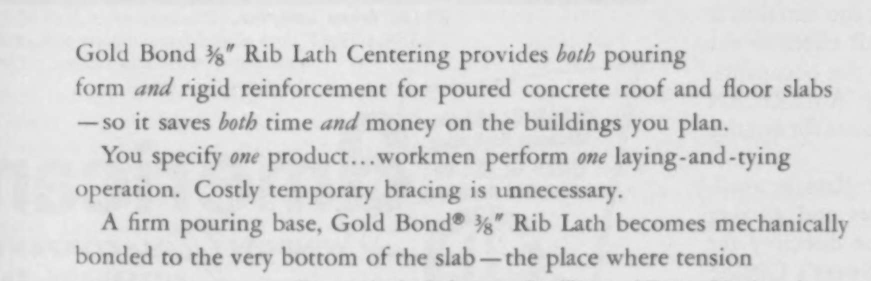

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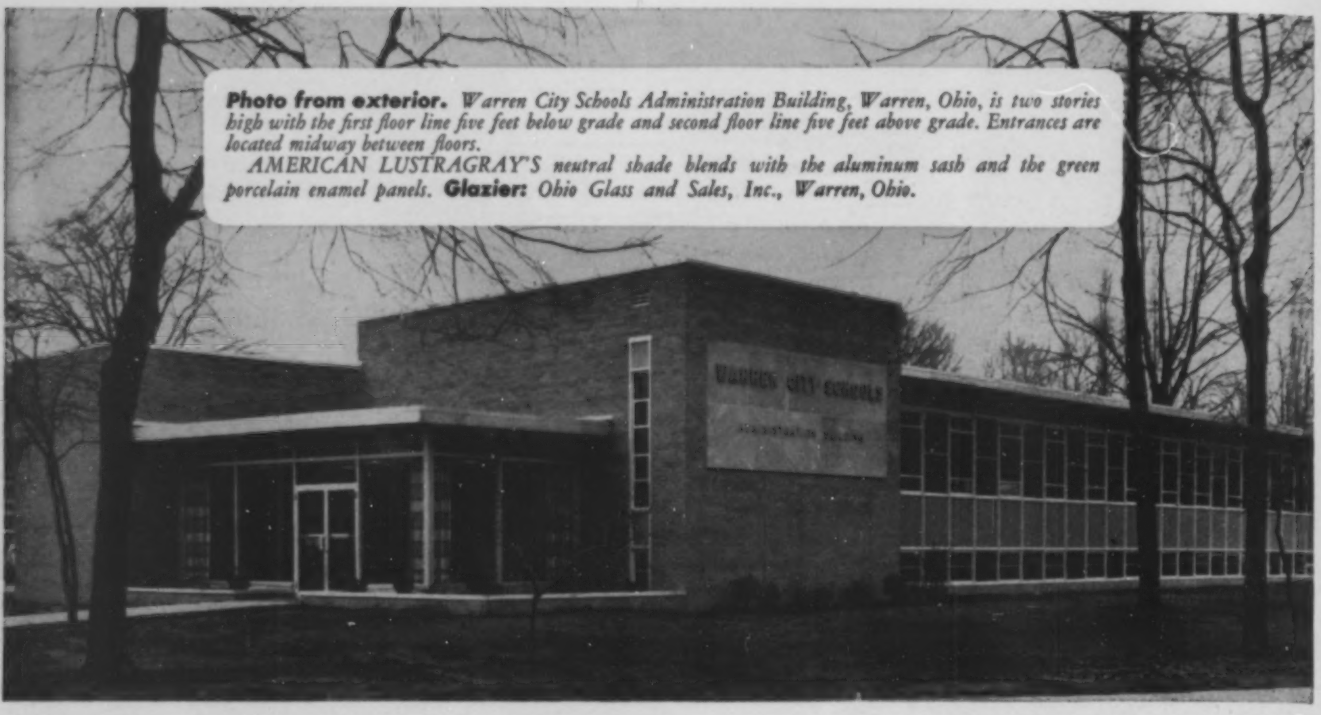

**Photo from exterior.** *Warren City Schools Administration Building, Warren, Ohio, is two stories high with the first floor line five feet below grade and second floor line five feet above grade. Entrances are located midway between floors.*

*AMERICAN LUSTRAGRAY'S neutral shade blends with the aluminum sash and the green porcelain enamel panels.* **Glazier:** *Obio Glass and Sales, Inc., Warren, Ohio.*

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**Photo from interior.** *Windows of AMERICAN LUSTRAGRAY sheet glass reduce sun glare 50%, minimizing eyestrain and fatigue, yet provide excellent vision.*

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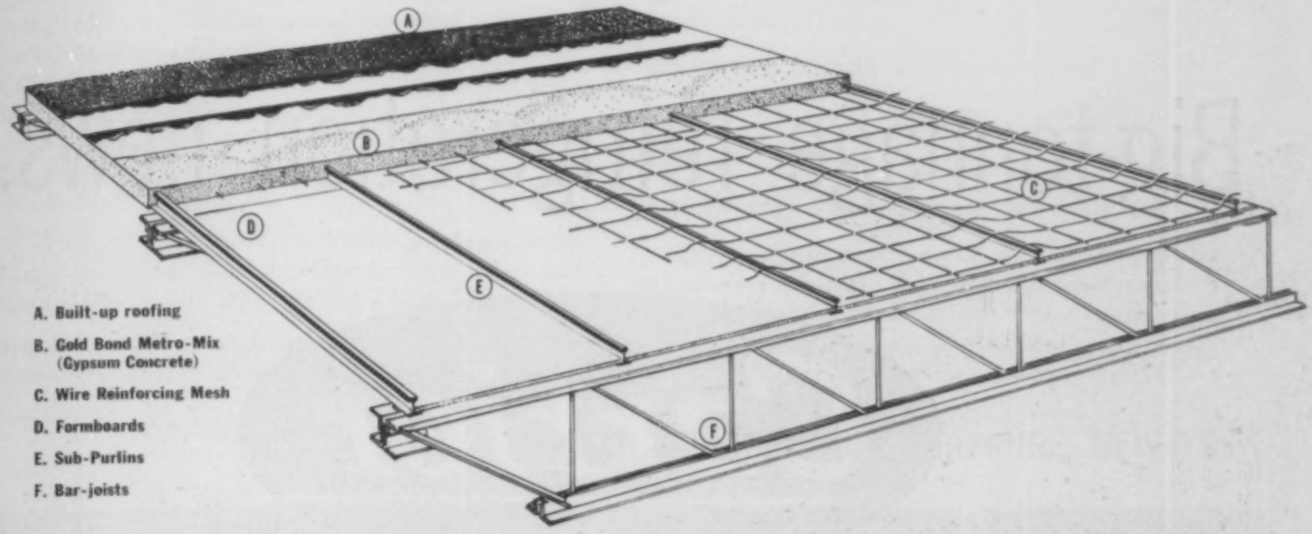
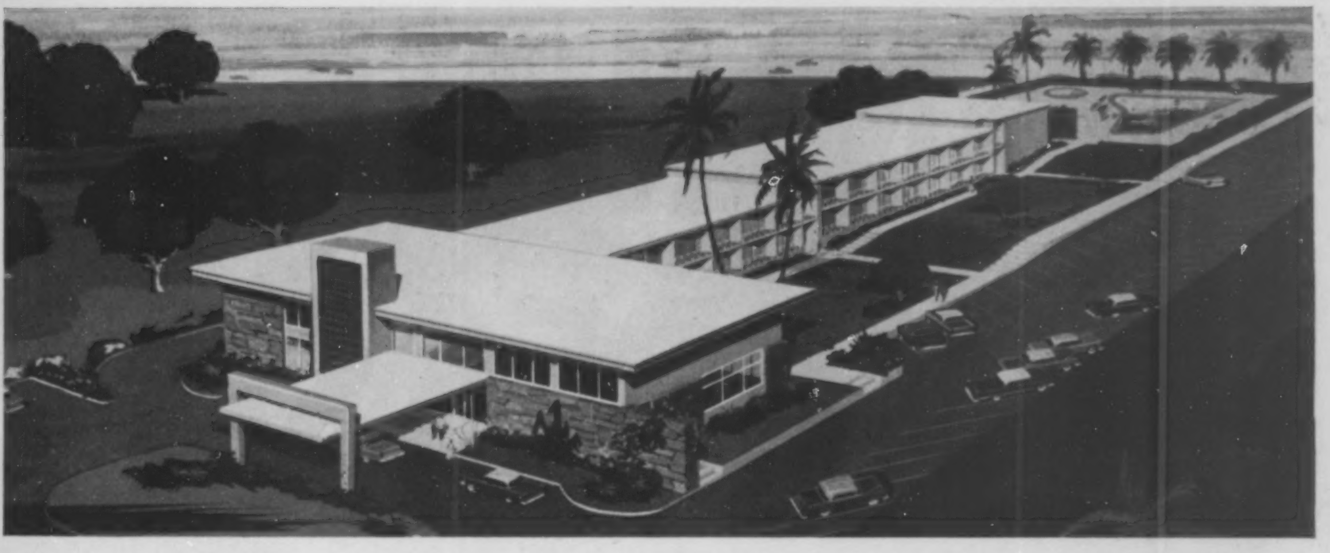
# This Poured Gypsum Roof Deck



# on this Florida resort hotel



# is constructed to combat hurricane winds

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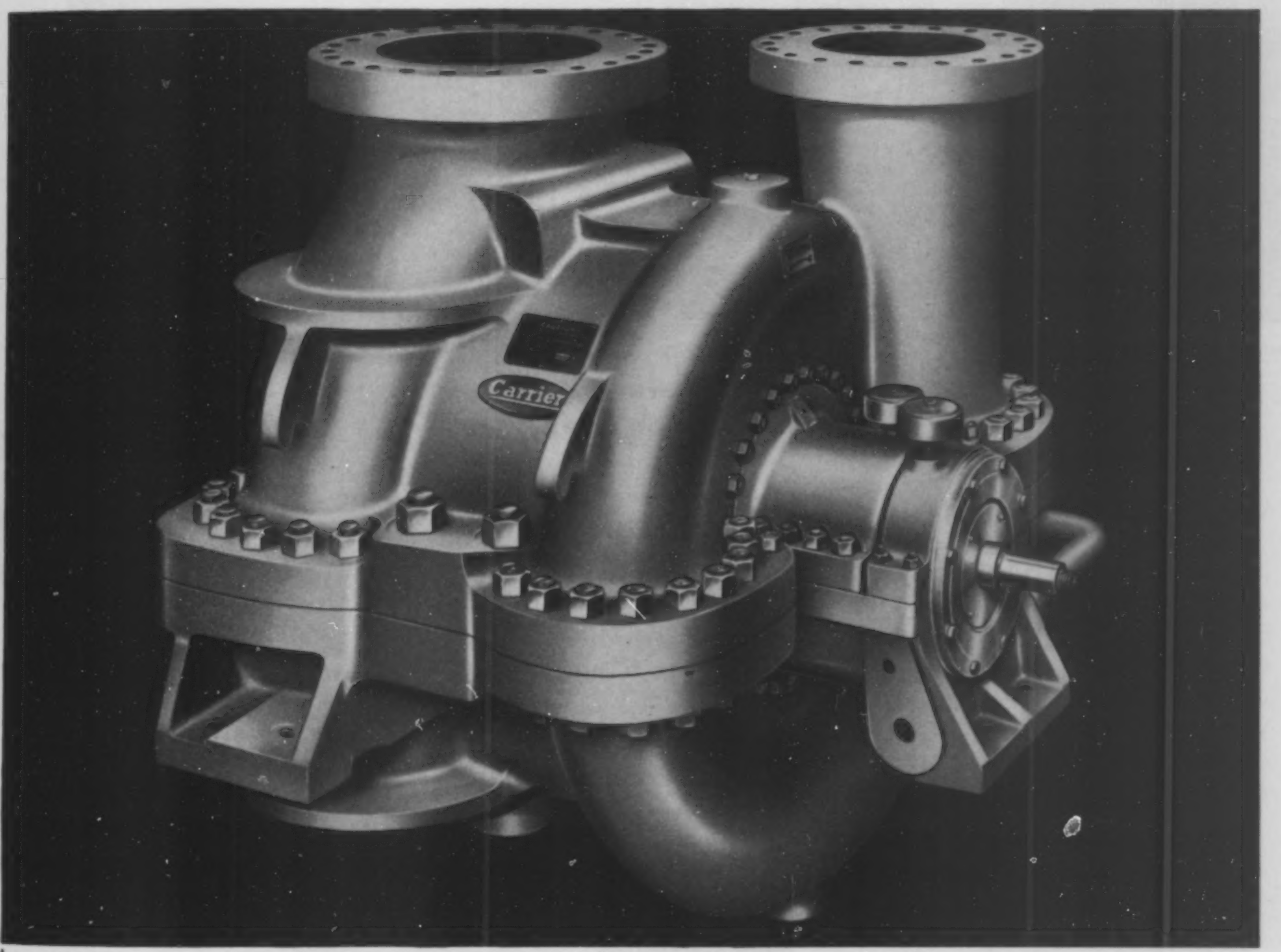

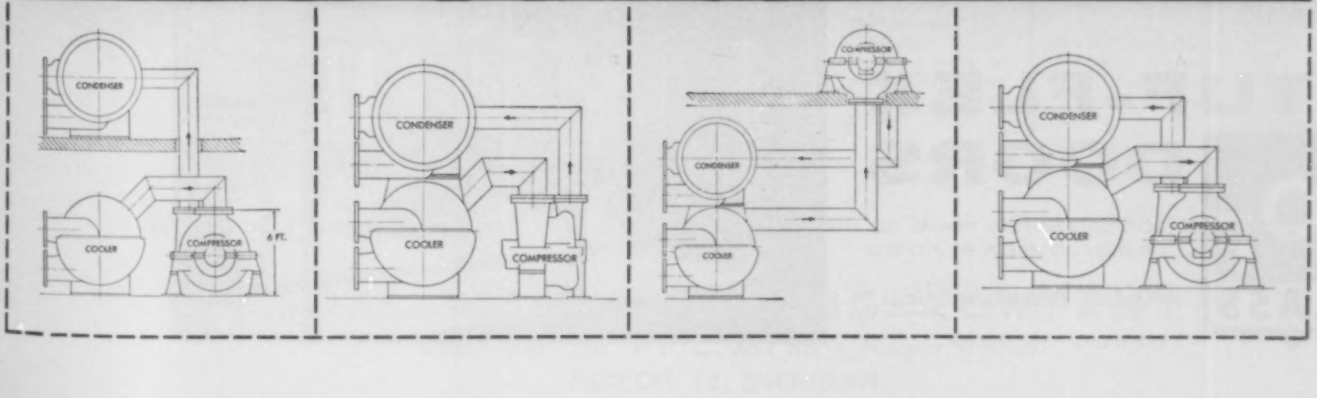

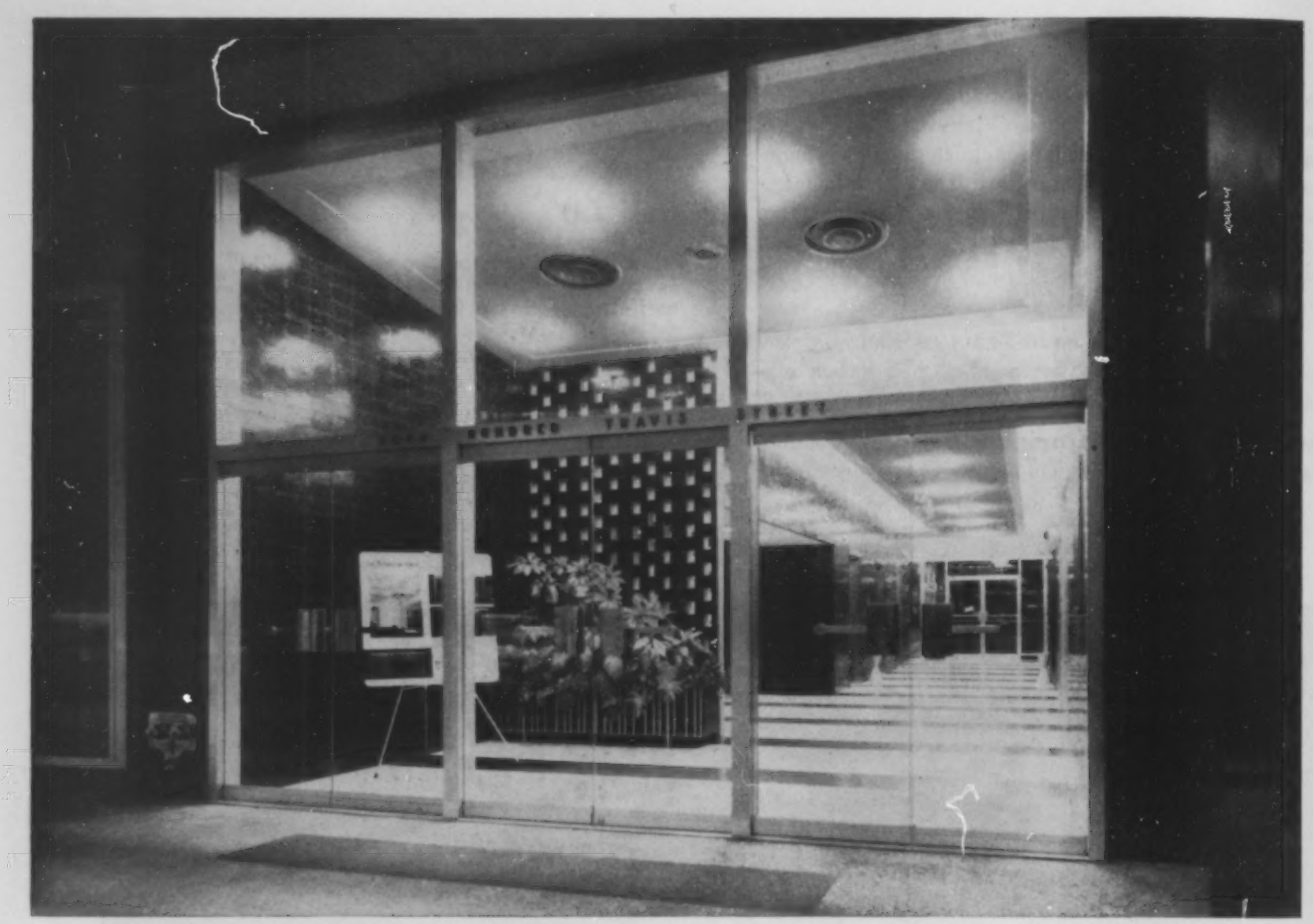

*Architects:* Nield & Somdal, Shreveport, La.

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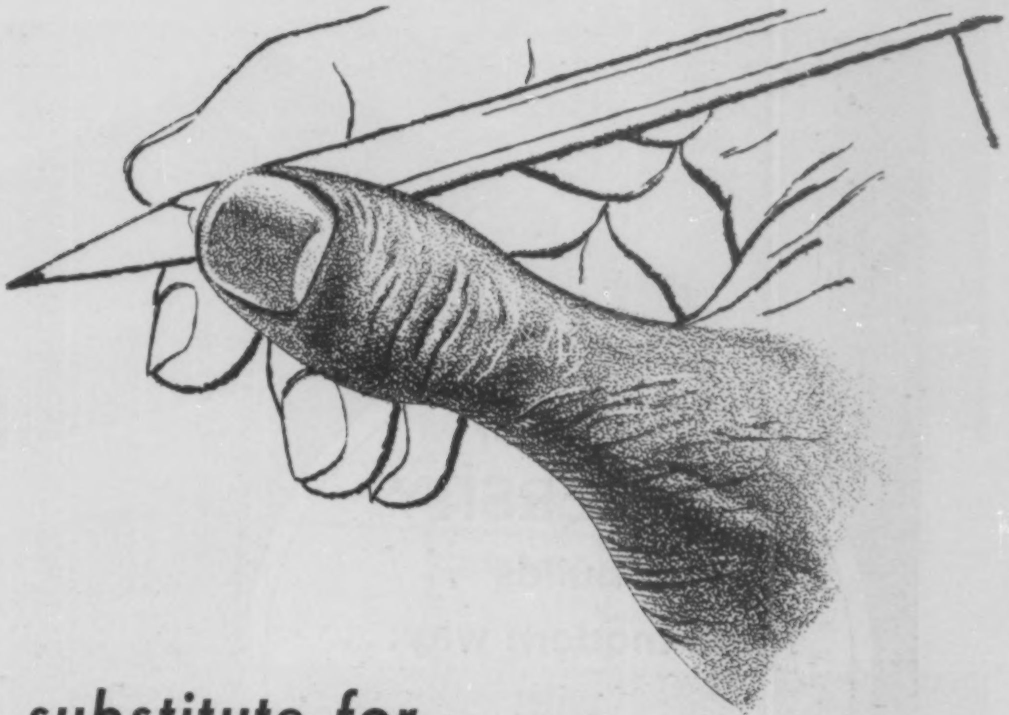

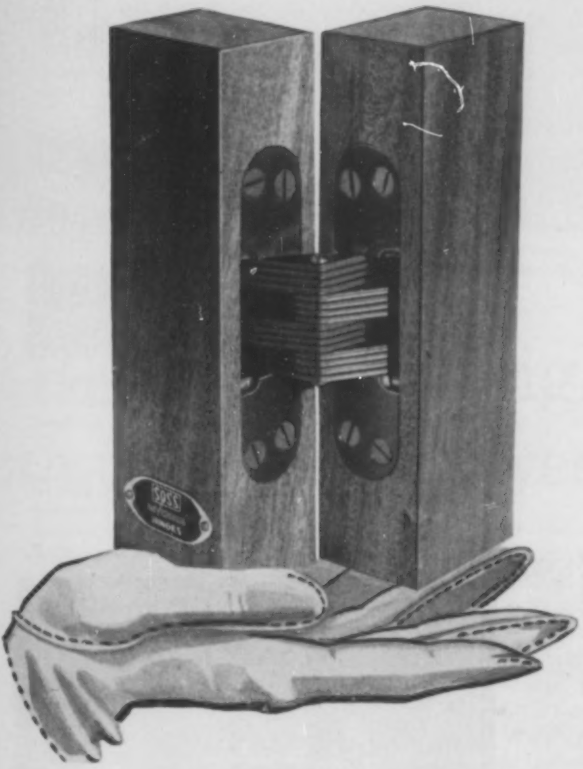

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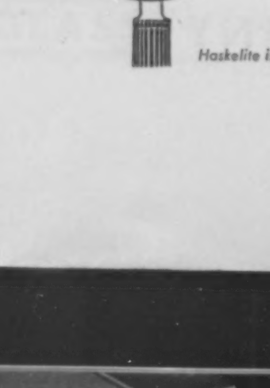

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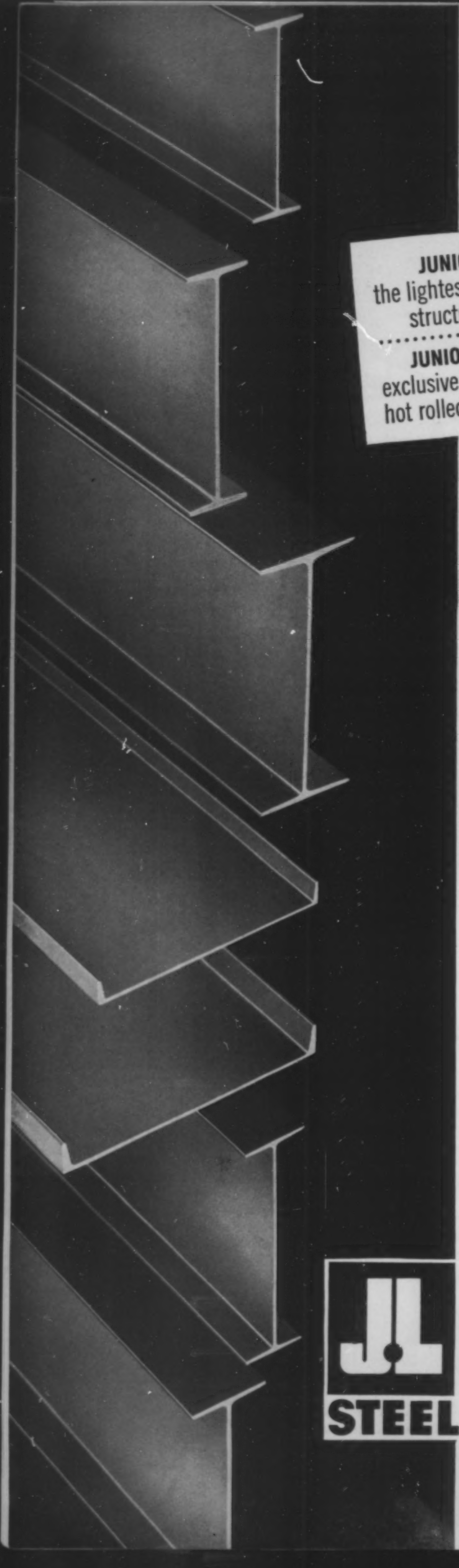

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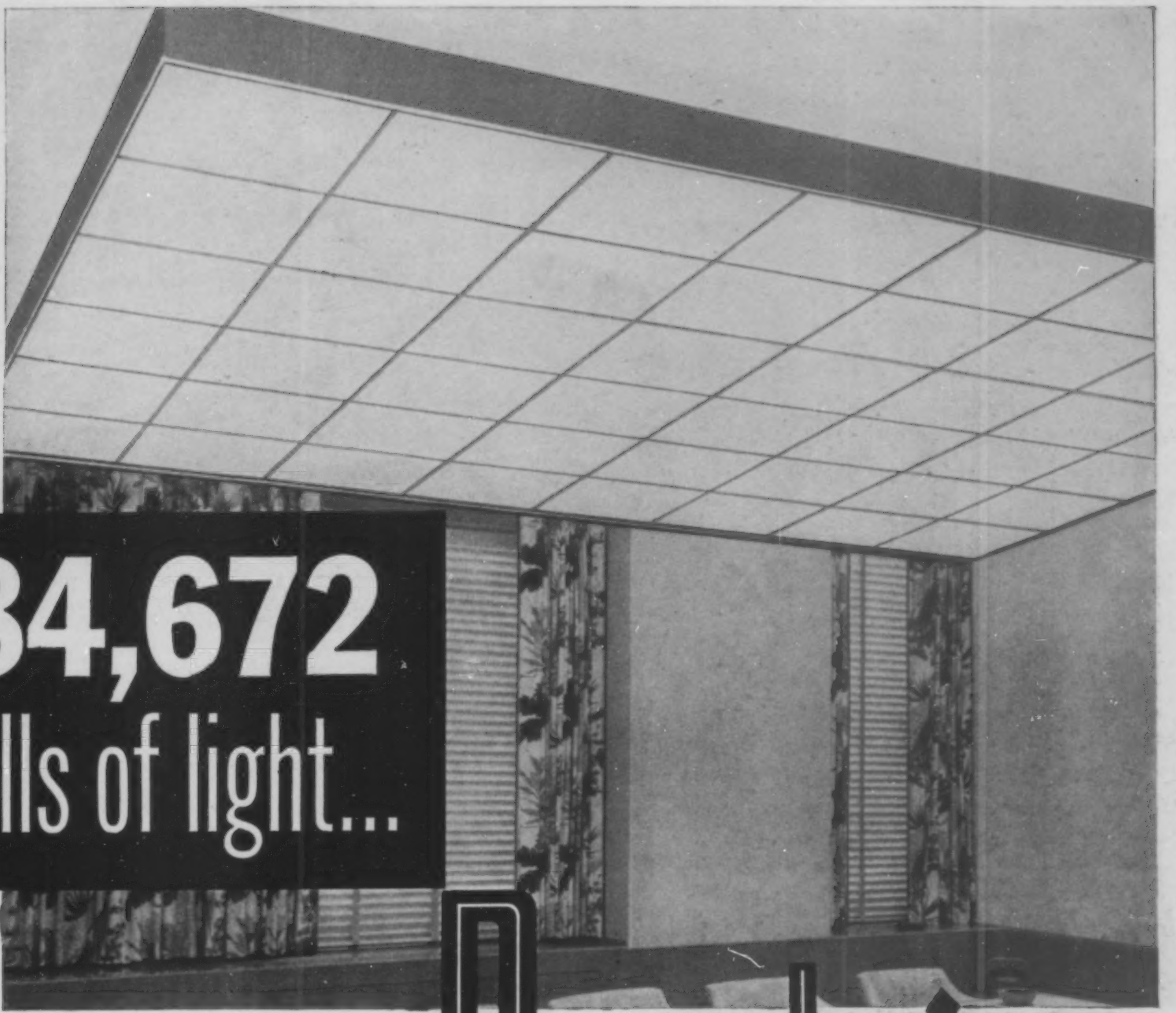

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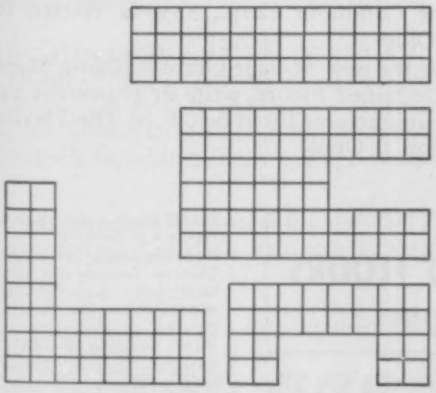

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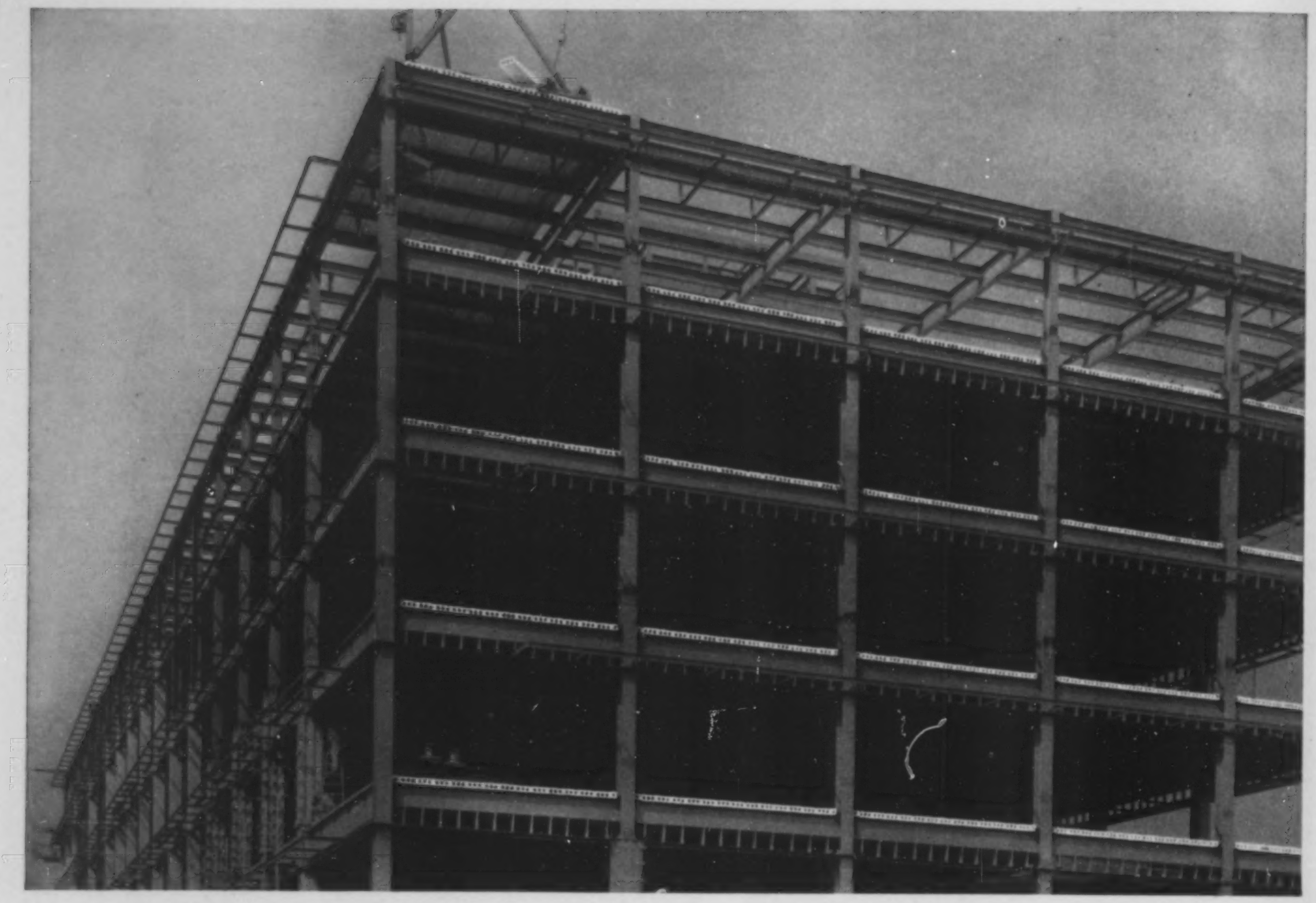
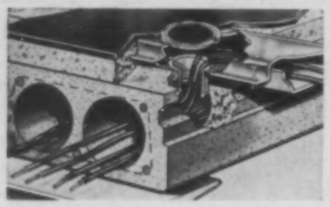
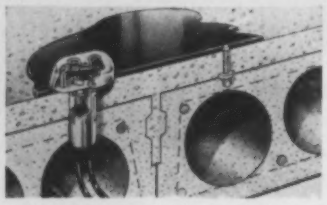


# Precast Concrete Electrified Floors In New Research Building



Wiring drops from header duct into cell at handhole junction.



Wiring then runs either way through cell to floor outlet.

To install outlet: drill hole at outlet location.

Next, install fitting in floor and fish wire.

Last, attach electric or telephone outlet box.

This new engineering and research building for the National Cash Register Company in Dayton, Ohio has Flexicore electrified floors.

The steel frame structure was designed for either concrete or steel cellular floors. Concrete was selected because no fireproofing was required on the ceiling and because of other cost and time saving advantages.

In the construction picture above you can see the hollow cells in the exposed ends of the precast floors. These cells are used as electrical raceways, and electrical outlets can be installed in the floor at any point along a cell. Cells are spaced $5\frac{1}{3}''$ on centers with the 6 x 16 Flexicore unit used on this job. Conduflor electrical fittings were manufactured by the Conduflor Corp., 3338-G Warren Rd., Cleveland 11, Ohio.

For a copy of the new 32-page Office Building Manual on Flexicore Electrified Floors, write or phone the nearest Flexicore manufacturer listed below, or The Flexicore Co., Inc., Dayton 1, Ohio.

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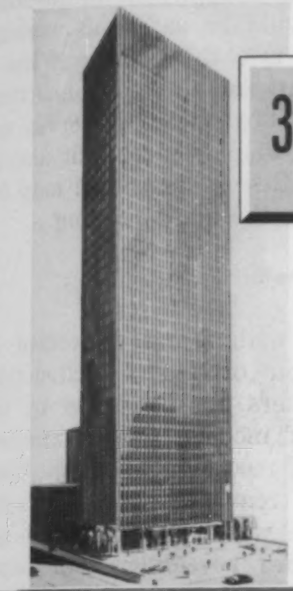

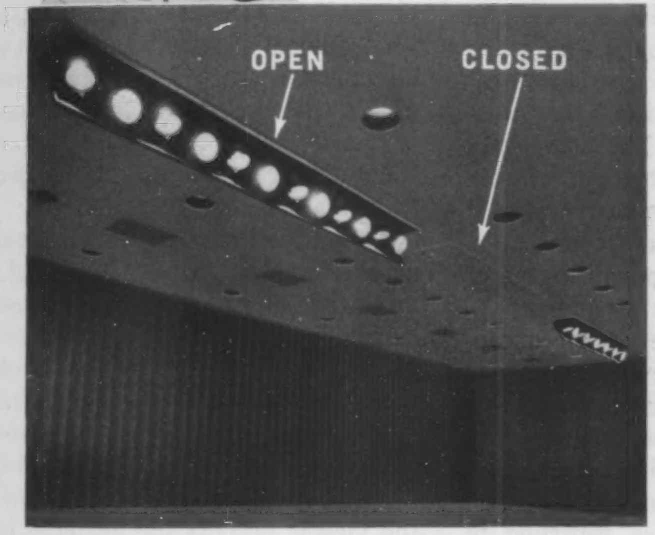

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the machine work comes in, a third in painting it, and a third in putting it together. Material costs run between 5 and 10 per cent of total cost as a rule, but may account for as much as 20 per cent of a simplified model. The raw materials in the Pan American terminal model (page 106) cost about $500.

Good model workmen are very hard to find. Most shops are constantly on the lookout for accomplished pattern makers, cabinetmakers and the like. Nearly all shops avoid hiring architectural students, the most obvious reservoir of part-time workers, although most have experimented with using them. "They get opinions about the designs they are working on, and want to argue about them or improve them."

As in any custom work, modelmaking has periods when extra hands are briefly but badly needed. To give themselves some leeway for work fluctuations, most modelmakers keep at least one other iron in the fire. Conrad, for example, purchases old houses in Jersey City and rehabilitates them; the three or four men normally busy on this work can be pulled in on short notice and put to making steel-wool foliage on trees or polishing out tool marks on metal. Salmon's side work is graphics for publications. Mario Cappabianca, of Stamford, did packaging and display work, and Dennett did cabinet work until their shops recently became too busy on models alone. Virtually all architectural modelmakers do engineering models and full-size models of new industrial products too; in some cases it is difficult to tell which is the main line of work and which the subsidiary.

Modelmaking is by nature a small business, and few shops reach a $100,000 annual gross on architectural models. An annual gross approaching $250,000 is very big model business indeed and probably about as large as an architectural model shop can economically get with present techniques. The limits are set by the supervising capacities of the boss, for this is the kind of operation in which growth means bankruptcy unless the closest control is exerted continually over every stage of the operation. Any man who can invent the new techniques needed for a new model problem, and parcel out the work, and control the costs, and explain to the workmen what the architect wants, and explain to the architect what the workmen are doing, might as well set up in business for himself—and he usually does.

Modelmakers always give a cost estimate on a job in advance, based on the rough sketches or model drawings or final working drawings submitted to them. Sometimes they bid on a job just as contractors do for a full-scale building. But the contract is more apt to be on a cost-plus basis. The thing that makes the end cost of a study or a study-and-exhibit model chancy is the very fact that the model is a design and study object. If, while the work proceeds, the architect does some redesigning, the costs begin shooting up. Yet sometimes the most valuable service the model can perform is to demonstrate, as it takes shape, the need for redesign. As a rule, the client pays the cost of a model and becomes its owner.

The traveling life of an exceptional model like Lever House can go on and on, but for many a model there comes a time when nobody knows where to send the thing any longer, or what to do with it. Such models are sometimes returned to the maker for him to contend with. Most modelmakers are psychologically unable to destroy their models; the very thought repels them, so they find storage space for the obsolete model somewhere. Conrad has found that the cheapest space is old garages, too short for the new cars. He has five of them in Jersey City now, stacked with models which he sometimes rents out to photographers and TV producers. Other models meet with accident before old age sets in. The 12-foot-high, half-ton model of the Seagram tower which was on outdoor exhibition at the construction site for more than a year, was dropped by workmen and its structural backbone broken. The Manufacturers' Trust model was given or lent (there is a misunderstanding about which) to an architectural school, and there dismembered by students for materials to make their own models. The Connecticut General model, on the other hand, should be safe and working hard far into the future; it has a permanent place in the Connecticut General lobby where it serves not only as a display piece, but also as a sort of three-dimensional map for visitors to the huge building.

### Not for the birds

Along with being distressed at the notion of model destruction, modelmakers are disturbed by the misuse of models. The commonest misuse of models is to mount them low and treat them like bird's-eye views—in which case they are not much more revealing than paper plans. Most modelmakers agree that even a large and tall model ought to be mounted with its ground level only a little below eye level, at least 4 feet 2 inches above the floor, so the viewer can look into it and up in it, instead of down on it.

To get the illusion of looking at an actual full-size project, instead of a miniature, there are two old devices, suprisingly little known. One is simply a piece of metal foil—a candy wrapper is fine—with a tiny view hole pierced in it. The foil blinder blocks off the view of the model's full-size surroundings, and presently the viewer accepts the model as being full size itself; the principle is the same as that used by marionette showmen. The other device is a sort of reverse periscope, with the opening for the image at the bottom, where the eye level of a little man in the model would be. "All you need for it," says Modelmaker Salmon, "is two mirrors and a Nabisco box."

For an opposite effect, to see a large model whole and small and to catch any inconsistencies in workmanship, the makers often use reducing glasses. But this device is of no use to a person studying the effect of the project itself. A reducing glass makes the model look *more* like a model. And after all, the point of all this work and money is not to marvel over the charm of the miniature, captivating though it may be, but to get a preview of real life.

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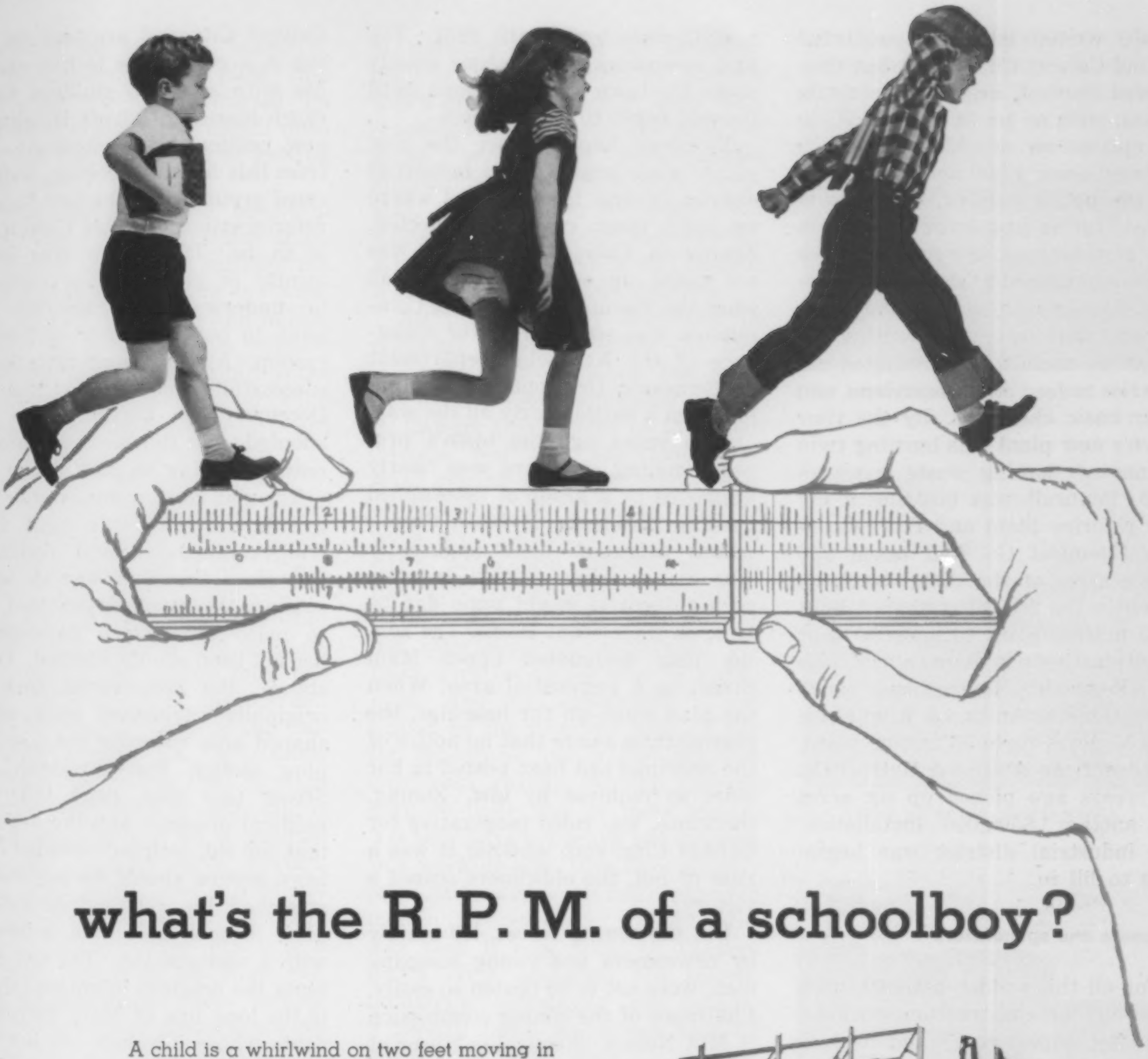

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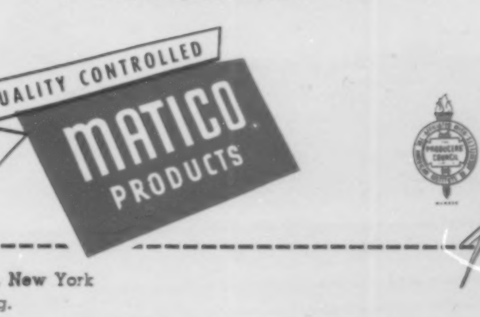

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sonally written letters to, conducted around Calvert City, and, when they showed interest, helped by intricate means, with no profit to himself, to get options on suitable land. Airco optioned some 1,500 acres, comprising the better part of 40 marginal farms, for it had large plans. On this plot, between the town and the river, it proposed to set up an industrial district into which it hoped to attract, with the cohesiveness peculiar to chemistry, associated industries to feed off its acetylene, and other basic chemicals. By the time Airco's new plant was burning twin plumes of flaming waste gases in 1953, Pennsalt was building a big new chlorine plant and B. F. Goodrich Chemical Co. had taken 230 choice acres of the Airco tract, on which in the following year it built a $5 million plant to make a basic vinyl plastic from Airco's acetylene and Pennsalt's hydrochloric acid. Later General Aniline & Film Corp. took 55 acres for a $6 million plant, and American Aniline & Extract Co. two years ago picked up six acres for another $500,000 installation. The industrial district was beginning to fill in.

### Boomers and speculators

For all this sudden activity, with its influx of construction workers, company supervisors, and technicians, Calvert City was hardly prepared. Its telephone exchange was in a local living room, and new lines were hastily run out on the bare ground. Its water and sewage mains soon proved inadequate or nonexistent. It was not even incorporated as a sixth-class town until 1951. The first companies on the scene quietly made the town a $10,000 loan until it could begin to collect taxes.

By sheer happenstance the new plants were located in an industrial district beyond the city line where no town taxes could be collected. Zoning in Calvert City itself was not taken up seriously until 1952 when the Planning and Zoning Commission was set up with the assistance of the Kentucky Department of Economic Development. Zoning has been a battle nearly all the way.

Two years ago the town's proposed zoning structure was nearly destroyed by a group of determined old-time residents of Main Street, whose brightest hope apparently was that a filling station or some such enterprise might some day be built on their front lawns. The zoning plan designated upper Main Street as a residential area. When the plan came up for hearings, the postmistress swore that no notice of the hearings had been posted in her office as required by law. Zoning, therefore, was ruled inoperative for Calvert City, and, whether it was a ruse or not, the old-timers scored a victory.

But the zoning forces, led mainly by newcomers and young company men, were not to be beaten so easily. Chairman of the zoning commission is Milt Nelson, chemical engineer at Pennsalt by day, civic worker by night, and a hulking Michigander whose northern speech and direct approach are strangely effective in a room of soft-spoken Southerners. Nelson is typical of the younger company executives who live in Calvert City and are bent on making it a good place to live—he and his wife and two children have a ranch house in Calvert Heights, the new residential development — and from this forward-looking, well-educated group arises the best hope and determination of what Calvert City is to be. The group was instrumental in getting their companies to underwrite a $350,000 bond issue to build a water and sewage system. And it counterattacked so successfully on zoning that last December a master plan was adopted, and the members are currently working on subdivision laws.

The plan sets up three major zones within Calvert City: light industrial, commercial, and residential. But since the plan was so late in coming, the formlessness that mars so many small-town developments has not been wholly avoided. For instance, the commercial zone was originally envisioned as a square-shaped area covering the new shopping section that straddles Main Street (see map, page 113). But political pressure and the argument that the old, railroad-oriented downtown section should be included has stretched the commercial zone out until it now looks like a box kite with a vestigial tail. The box represents the original intention; the tail is the long line of Main Street residents whose interests are not to be sacrificed. And thus the forces of strip development, which already have decked the highways with jukebox parlors and other drive-in embellishments across the land, sinuously go their way.

Yet, in a vigorous if not always esthetic pattern, Calvert City has had a building boom, the first in its history, that has raised a substantial number of new structures to accommodate a sharply expanded population. There is a new $55,000 Presbyterian church (to raise this much money required the highest per capita donations of any Presbyterian congregation in the U.S.), a trim-looking telephone office building, and a two-story brick apartment house. The rest of the new building, however, has mainly been

PHOTOS: HARRISON BROWN

*The city began growing along the weeds and shacks of the ICR tracks.*

the work of the so-called "boomers" or "speculators," who piled into town when the plants started up. Their natural and irrepressible optimism has had the virtue of getting things done.

It also has had less beneficial effects. The overly ambitious shopping center, which has suffered the ills of building too much too soon, was a product of excessive optimism. So were the new homes in brightly painted Calvert Heights, built in the $12,000 price range, higher than anyone in the county had ever heard of. They are moving only slowly, at a rate of about 30 sales a year.

Nevertheless, despite the gloom that emanates from some Calvert City citizens, only one of the "boomers" has given up and gone back to the big city. A lower priced housing area is being opened, and builders are cautiously advancing only one or two units ahead of the market. Says J. B. "Boots" Conn of the Calvert City Lumber Co., who came over from Missouri in 1951 to catch the best of the city's growth, and is staying on: "It will be a gradual sell." The builders have learned, among other things, that it is suicidal to be against zoning, for mortgage money no longer comes easily to a new town that does not show evidences of planning. Conn became such a proponent of planned growth that, to his own great surprise, he was named to the Planning and Zoning Commission. Thus in mysterious ways do things work out.

**A jaundiced feeling**

Perhaps the biggest of all Calvert City's miscalculations, however, was the idea that a populous city could grow swiftly around a chemical industry, an industry in which highly complex, automatic plants are run by a comparative handful of workers. Luther Draffen and his friends envisioned drawing in light industries with larger payrolls to work with the basic chemical products, such as Goodrich's vinyl plastic, Geon, which is used in making plastic moldings, sheets, raincoats, baby pants, and the like. But this kind of industry will not be attracted until a further stage in Calvert City's growth is reached. More civic amenities are required, facilities for living beyond the incomparable hunting and fishing already available. And this may not come until more of Airco's industrial district, a large part of which is still vacant, fills in with more basic industry.

All this, plus the slowdown in chemical expansion after the tremendous build-up since the war, has engendered a jaundiced feeling in Calvert City. Some of the older citizens feel that the industries, after getting what they wanted out of the town by pleasant negotiations, are now inclined to forget the city's needs and aspirations. On their side, the companies' top executives, pursuing their objective of not interfering in community affairs, give an appearance of aloofness. And this appearance is not helped by the fact that most of the top executives live in Paducah and only pass swiftly through Calvert City on their way to their plants. Yet they have not really lost interest in a working city; they have encouraged and supported their younger men in civic activities; and they predict that if only some of Calvert City's civic problems are solved, industry's investment will double.

Russell Lund, operations head of Airco's big plant, puzzling over the situation, says: "It seems that in this area living on the farm is the accepted way of life. When more money comes in because of a job in industry, the home itself is the last item to be brought up to contemporary standards. First comes a car, then plumbing, then the whole gamut of commercial appliances. Our men have become gentlemen farmers." And to many, this would seem an ideal life.

But the dream of becoming a big city, at least among Calvert City's civic leaders, will not down easily, and it sets up frictions. Perhaps the most real and exacerbating of these is the tax problem. When Calvert City was incorporated, it was understood that the industrial district, after getting settled, would ask to

*continued on page 200*

*The boom-time shopping center.*

*The homes of young management.*

*The charming downtown of a bygone era.*

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*The junction of things to come.*

**CALVERT CITY** *continued from page 199*

be annexed so that it might bear a fair share of the town's financial burden. But as zoning lagged and other civic problems seemed no closer to solution, the industries hung back. Added to this was the growing fear that the tax-starved community would make unreasonable demands, seeking taxes on all employees rather than on only those living in Calvert City, and the fear that the city would want a greater share of control over the industries' operations in such matters as smoke abatement and other ordinances. Yet these are not insuperable difficulties, either. "If zoning were proved enforceable," says Goodrich's Plant Manager Walter Brodine, "and if the payroll tax were satisfactorily adjusted, annexation would be a very small problem."

Luther Draffen, now nearing seventy, feels that if the atmosphere of mutual trust that existed in the early days could be revitalized, all would be well. And now may be the time, many residents think, for civic and industrial leaders to sit down together and rethink their objectives, review how far they have come, and what they desire Calvert City to be.

**Nature and industry**

What could a small town like Calvert City have done to smooth the path of growth for the small community? First of all, a comprehensive city plan should have been adopted well before, or as early as possible after, the industrial influx. Some of the benefits of planning may yet be salvaged by working on the zoning of the county land between the town and the industrial district. Recent Kentucky legislation allows a city to work with a county in setting up a planning board that would have authority over both. Second, the matter of taxation, a weighty weapon both in getting and keeping industry, should be clarified and understood by all parties. Finally, some creative element, such as an architect, ought to be brought in on the planning. This is the most difficult aspect of all, for the big problem in small-town growth is that it lacks focal points, is so culturally thin and unattractive in the main.

Perhaps the most important message to be taken out of Calvert City is that the chemical industry is but the forerunner of what all industry will be when automation and other complex control systems run their course. Hence it may be well to give up the dream of building more big-city complexes, and to strike some balance between a semirural and an urban civilization that small towns like Calvert City already are trending toward. In many ways such a balanced community will be safer in the world and the economy that is now building, and it can harbor and increase many important human values. The ideal of such a balance between nature and industry has been with the race since the ancient Greeks. It is glimpsed again in Calvert City. END

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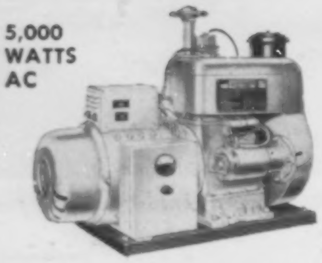

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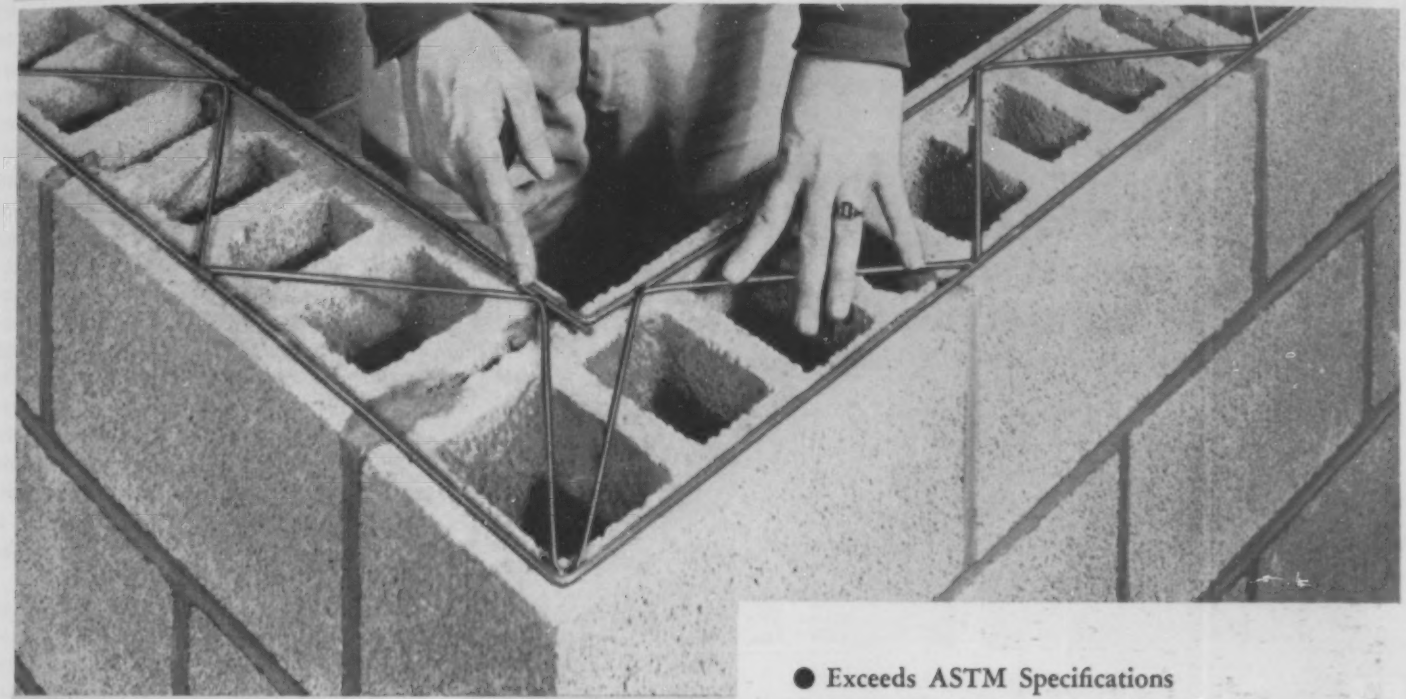

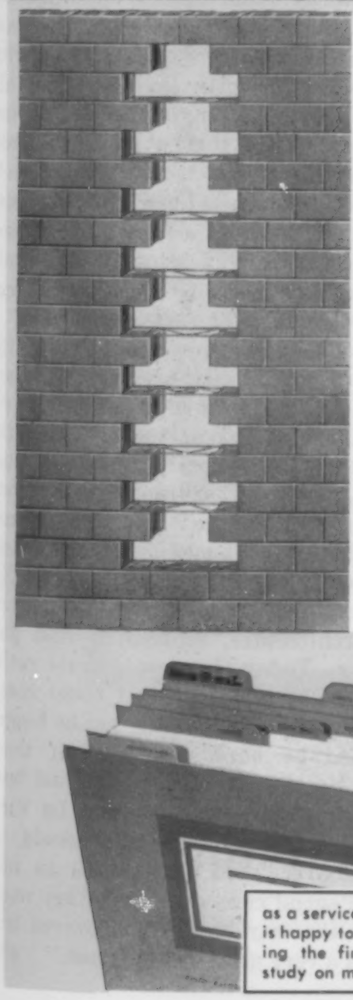

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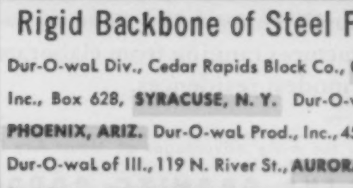

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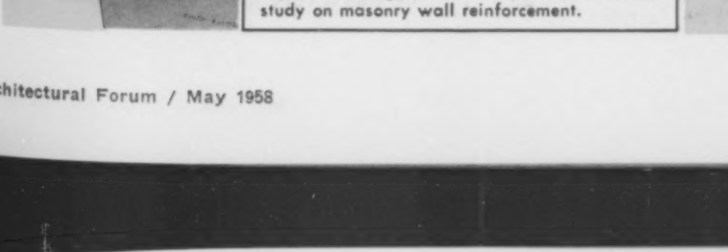

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**GREENWALD** *continued from page 119*

seems to mean, if not more, at least as much, to Greenwald as profits. His association with Mies gives him not only profitable, notable buildings, but a valuable intellectual relationship which he cherishes. Also, he feels that by building fine buildings and collaborating with Mies, he is somehow making up for a lack of creativeness in himself. He frequently laments: "If I could write poetry or paint, I wouldn't be doing what I'm doing."

In many respects, Greenwald is the ideal client. Says Mies: "He is very easy to work with. He has a sympathetic understanding of what we are trying to do. He could make a lot of money by building other buildings but he really is interested in good architecture. He is not afraid of our ideas. He wants to leave his stamp on the scene." Even more revealing of the bond that has grown between the 72-year-old master architect and the 41-year-old builder is Mies's saying: "I look forward to having lunch with him. He likes to talk about—and what is important he finds the time to discuss—philosophy."

Greenwald is equally affectionate toward Mies, although he admits that working with the master is not always easy. "Mies is no prima donna, but when you work with him you have to be ready to change laws and technology." The two have already done considerable changing of technology—they pushed the development of special colored glass for the Chicago Lake Shore apartments, and have pressed metal and glass manufacturers for many other product improvements. Technology is a favorite subject of Greenwald's. He thinks most U.S. manufacturers are too complacent about building technology. He is constantly wrangling with producers over everything from metal panels for curtain walls to doorknobs and commodes. This again is a reflection of the man's spirit. He is a restless perfectionist with a deep feeling about building what he considers good housing.

Greenwald has battled lenders as hard as he has fought building materials manufacturers. Most lenders have shied away from Mies's buildings because they are considered "too advanced." But Greenwald has stuck with Mies's designs, although he has made his job as money raiser tougher. Mies himself says: "He turned down $12 million for the Commonwealth Promenade and 900 Esplanade apartments because one lender wanted a masonry spandrel and other modifications. Greenwald said no, the glass will go all the way to the ground. This takes courage."

Greenwald is impatient with the present pace of city progress. The answers to the problems of urban renewal, the saving of the city, and the creation of the "perfect physical machine for living" are not coming along fast enough to suit him. He thinks that builders should be trained like architects, in universities with special courses in mechanics, physics, materials, architecture, economics—and philosophy. Today Greenwald could retire "with more money than I could spend in a lifetime. But I would not be happy. I would be bored to death if there weren't always problems. You just have to know what you want from La Vie."

Perhaps Mies sums Greenwald up best: "Greenwald began with an idea of the social consequences of his work. Along the way he also discovered that he was a very good businessman." END

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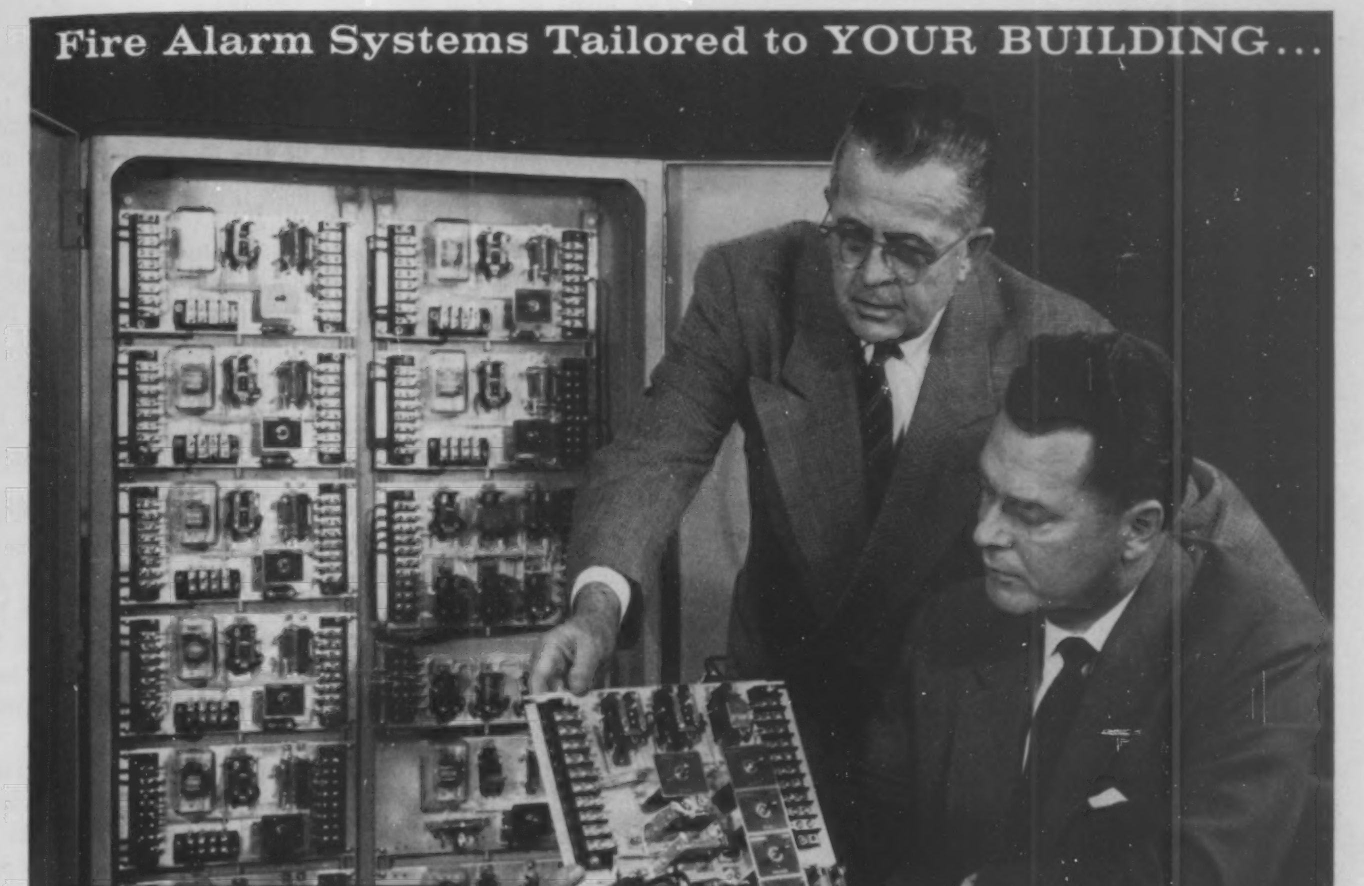
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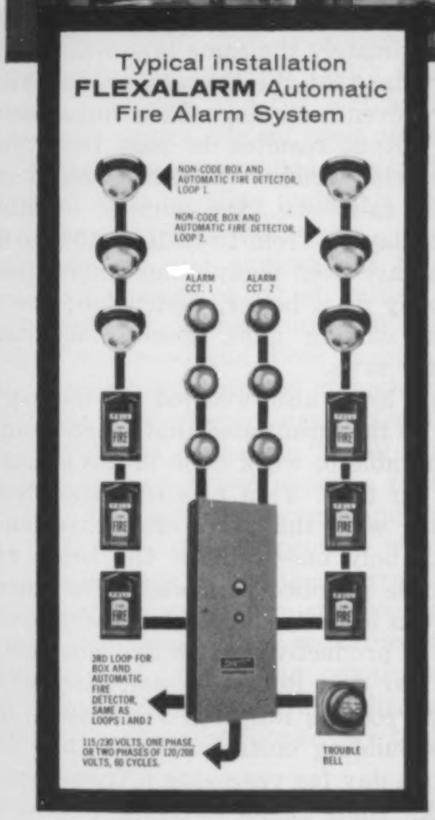
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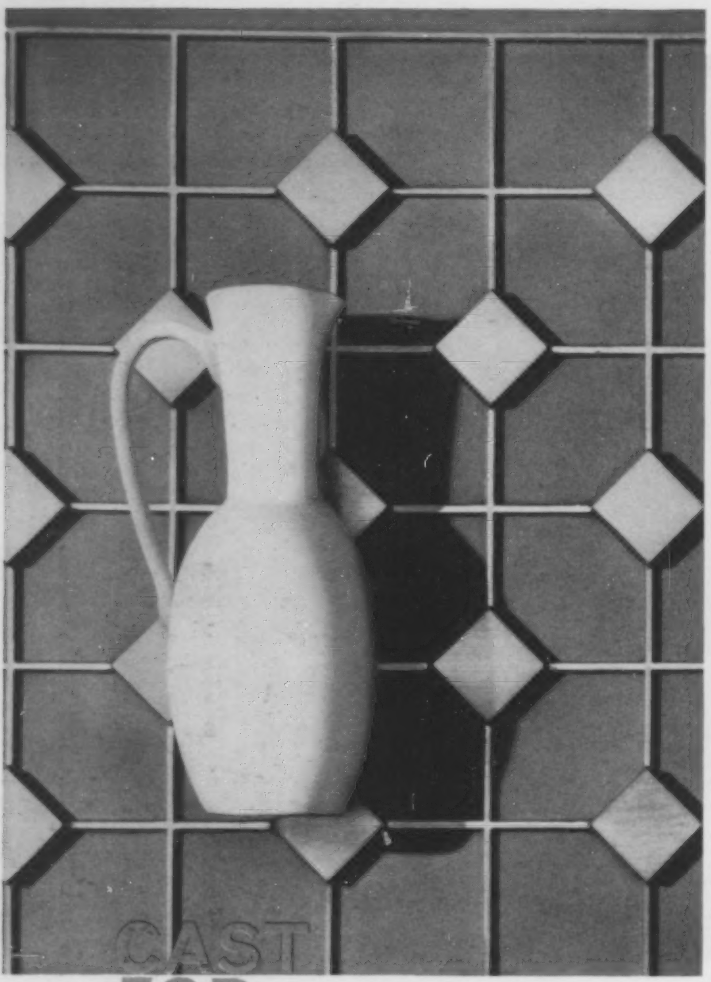

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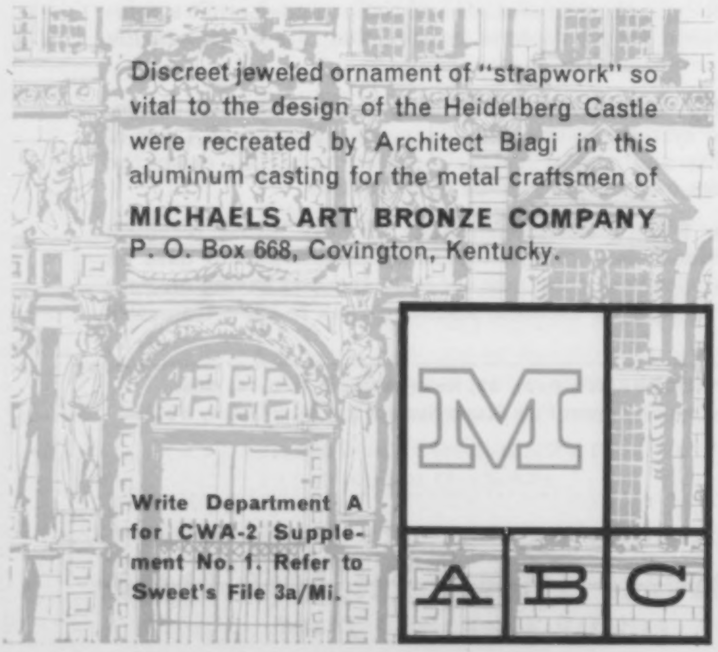

that time, we would have had to use 15 mechanics."

Montgomery also recalls that in 1950 his organization put up 45,000 square feet of tile in the new Providence Hospital in Waco by the conventional method, and it took a crew of ten men about four months to do the job at an over-all cost for materials and labor of $2.25 per square foot. Early this year his firm completed a 90,000 square foot installation at the new Carswell Air Force Base Hospital at Fort Worth, using the thin-set process, and it only took five men about five months to do the work, at an over-all cost, materials and labor, of only $1.50 per square foot. Productivity improvement: roughly 33 per cent.

*Masonry.* The Bricklayers, Masons and Plasterers Union of America, tiring of all the brickbats thrown at bricklayers, has made a standing offer of $1,000 to anyone who can show proof that any subordinate union local limits the bricks a worker may lay. Critics retort that instead of limiting the number of bricks, union locals usually refuse to allow the use of techniques that would increase the number that could be laid.

But in New York last month, a large contractor checked his records on three hospitals his firm erected in 1928 and 1932 and found that the number of bricks laid by each mason averaged 309 per eight-hour day—equal to 270 in seven hours. On a hospital his firm erected in 1956 with approximately the same type wall, he discovered to his surprise that the average productivity was 353 bricks per seven-hour day. This unsuspected increase in unit output resulted in part from the new system of palletizing bricks which has helped cut the laborer-to-mason ratio—i.e., the number of attendant laborers per bricklayer—from 10-to-10 in 1932 to 6-to-10 in 1956. There have been many other innovations that help masons today do a better, faster job; the use of mortar buggies, calking guns, gunite machines and portable masonry saws.

Mason groups have also wearied of the perpetual need to explain to the uninitiated that scarcely any jobs today are comparable to work done in the era of 2,000 bricks per day per man. That rate was possible in old-style load-bearing walls that were often three and four feet thick, with only one-ninth of the brick exposed and required to be plumbed accurately. The unexposed central section was literally slapped together. To counter jibes about loss of productivity from the "good old days" of 2,000 bricks per day, Robert Taylor, director of the Structural Clay Products Research Foundation, likes to display a 1910 building costs handbook that declares that "400 bricks a day for veneering a frame house is a good day's work." Adds Taylor: "Today we have houses on which we are getting veneer work of 450 to 500 face brick—more wall per day, by quite a margin, than in 1910."

Contractor Stanley West, of Cleveland, has engineered and manufactures equipment for a complete "system" to simplify the handling of brick, block, tile, ceramic veneer, and mortar. In conjunction with pallets of several sizes, West utilizes a fork lift to deliver loaded pallets and mortar buggies to second- and third-floor level scaffolds, and platforms that hold bricks and mortar level so the bricklayer does not have to bend to handle them. Masonry costs are cut 10 to 25 per cent with his system, says West.

A lengthy list of similar time-saving, cost-reduction innovations and improvements that have quietly helped raise construction productivity in recent years could easily be compiled. It would include: self-powered work scaffolds that can reduce staging expenses about 30 per cent; cement-finishing machines that can trim finishing costs up to 25 per cent; pumps that lift hot liquid pitch up to built-up roofing jobs; powered pipe-threading machines; double-glazed windows; modern demountable partitioning; paints suitable for effective two-coat, rather than three-coat applications—and the prospect of effective one-coat paints—etc. But Construction Industry Consultant Robinson Newcomb, of Washington, D.C., cites two factors that have made particularly important contributions to construction productivity: better engineered building materials, and better structural designing.

### More functional design

"Before World War II," Newcomb points out, "house rafters were generally 2 by 8's; occasionally, for short spans, a 2 by 6 might be used. But today roof trusses engineered for spans of 20 feet or more are conventionally built of 2 by 4's. Today risers are spaced more on an engineering basis than on conventional spacing that carpenters used to practice. With the entry of firms with large resources and the increased interest of the government in more efficient construction, the engineering skill that has been applied to manufacturing is now being directed to building materials designed for minimum waste in construction.

"Architectural and engineering firms now provide professional services of a high caliber directed toward solving problems. Designs are less monuments to the architects and more and more functional creations designed to make the best use of building materials and provide the most efficient square footage and cubage." And he goes on to say he can "recall a building that was designed with reinforced columns that were flared at the ceiling for both engineering and architectural purposes. But when the carpenters went on strike, the owners, the architects, and the contractors cooperated in a redesign which resulted in straight rather than flared columns. The result was a reduction in working hours per column that more than compensated for the increased wages the carpenters finally won. So the labor costs went down, even though the basic wage rate for the job went up."

Everything considered, the construction industry can view its record of increasing productivity with justifiable pride. But it can hardly afford complacency (see page 132). For it cannot be denied that the building industry is still confronted with great challenges and opportunities to further accelerate its gains through the development and utilization of still more improved materials, tools, methods, and design techniques that will enable it to build still faster, better, and less expensively.

END

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## BUILDING RESEARCH

*continued from page 135*

"The bald truth is that everyone in the industry feels the manufacturers should pay the bill." Scheick sees limitations to this approach, as does Tyler Rogers, head of the BRI operations subcommittee. Says Rogers: "It is wrong to think the manufacturers should finance all the work: home builders, for example, are already doing some research, but they could benefit from more. The contractors have done nothing to speak of in the way of research . . . and they could certainly benefit."

Despite the high purposes of the Building Research Institute, and its thorough understanding of the meaning and objectives of the program it tries to promote, it is regrettably true that BRI itself has failed to define its objective for the building industry. And among some of the most thoughtful people in the industry, including men who could give strong support—financial and technical—to a national research program, there is a certain fear of it: that some superagency is in creation, setting out to determine by mystic formula the future direction of U.S. architecture. One such skeptic, an architect, asks: "Who's going to run this thing . . . the Octagon crowd?" a reference to AIA Headquarters in Washington.

During 1958, BRI will have the task of swinging a giant industry behind its program. On the one hand, it would seem a small task in its beginnings, for the needs in terms of money are quite small: a fund of $100,000, which would pass directly from donors to researchers, would get a program started. (BRI does not want to set up a research fund to disperse to research groups itself; it prefers to act as a liaison between the sponsor and the laboratory. It would encourage sponsorship of worth-while projects. Later, when a project had shown results, BRI would disseminate the results to the building industry.) Surely, in an industry which represents $48 billion in annual revenue, there is $100,000—as a starter—available somewhere. But as Rogers warns: "It is futile to ask for money for an abstract fund. You need to define objectives."

Indeed, there is probably a great deal more than $100,000 available, but the getting of it will depend upon the way in which the program is planned and administered. At present, BRI is casting about for the right man to head the program; by coincidence, so is the Ford Foundation, to head its Educational Facilities Laboratories. The choice in either case, of course, will determine whether the programs succeed or fail, but BRI's selection seems much more critical, for its research director will have to build industry confidence in the program's importance, beginning with one or two research projects and expanding from the nourishment of their successes.

Potentially, the building research program could swell to many times the size of the Ford program in school construction, even with Ford's $4.5 million fund. Perhaps the Building Research Institute will go outside the building industry for its research man, as the brick industry did nine years ago, when it selected Robert Taylor, a physicist and mathematician, who was then a research man in the glass industry, to run its newly formed research organization, now thriving. Indeed, there are few men in architecture who really believe in building research—with exceptions such as William Caudill, who says: "It takes extra time, extra effort, and extra money, but we believe in it. And it is *not* product development."

The usual course of all discussions of building's research needs begins with a general declaration of the industry's backwardness and winds up with regrets that the manufacturers cannot be foresighted enough to do something about it. This is a handy technique, for it pins the blame squarely on the shoulders of those who would be best able to finance more building research. But is it ever going to produce real advances? Or is it like blaming the manufacturer of surgical instruments for the disgraceful state of nineteenth-century medicine? Why didn't *he* establish the germ theory?

If building is to strengthen its science base, it must cease, among other things, looking to its product manufacturers for all research sustenance. There are limits to this type of so-called research, for only those ideas which look like potential money-makers ever go into production. This is not to say that the profit incentive is ineffectual, but rather that it is already working at capacity. Beyond the inevitable development of new products, building could best begin by assessing itself for the initial funds: one dollar per year from each member of the AIA, Producers Council, the Associated General Contractors, National Association of Home Builders, and the associations of specialty contractors. With nobody pressed hard to contribute an undue share, a $100,000 fund could be raised over the week end. The researchers—and not some single group whose particular interest was newel post development or plastic door knockers—would have the pick of essential projects and the responsibility for carrying through their development. In a decade, the U.S. could develop the most advanced building research organization in the world, for the funds and talent are here. But today the U.S. ranks behind many countries of the free world in this respect, for it is one of the last nations to see the tremendous potential of such a coordinated effort. END

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### Establishing a building science

Outlined below is a description of the proposed research program of the Building Research Institute and related programs:

- BRI's chief research committee, under Leonard G. Haeger, technical director of Levitt & Sons, has recommended that BRI continue to hold conferences and technical forums, activities which will point up building research needs. Specific needs should then be reviewed by the Building Research Advisory Board, a 30-man group under the National Academy of Sciences. Proposals approved by BRAB would go back to BRI, which would seek sponsors and suggest research facilities. BRI will not do research itself.
- BRI subcommittees are investigating "problem areas," i.e., where research is needed, under Cornell Social Scientist Glenn Beyer; available laboratories, under Princeton's School of Architecture Director Robert McLaughlin; operations and methods of financing of a national research program, under Tyler S. Rogers, technical consultant to Owens-Corning Fiberglas.
- The American Institute of Architects will conduct a conference in the fall at which architects and authorities from such related fields as structural engineering, psychology, public health will define the areas where basic research is needed in architecture. A $6,000 grant from the National Science Foundation will finance this meeting.
- The Ford Foundation has set up Educational Facilities Laboratories, Inc., with $4.5 million to "help improve the construction of school and college buildings." Where research is lacking and thus hampering education's functions, EFL will attempt to stimulate activity. More than half of its fund will be used for experimentation in school construction and equipment, through grants to educational institutions.

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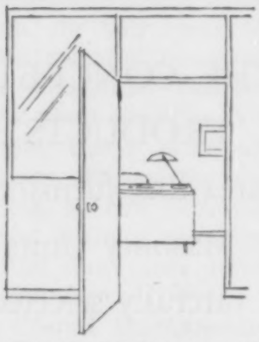

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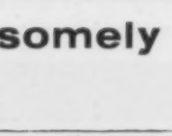

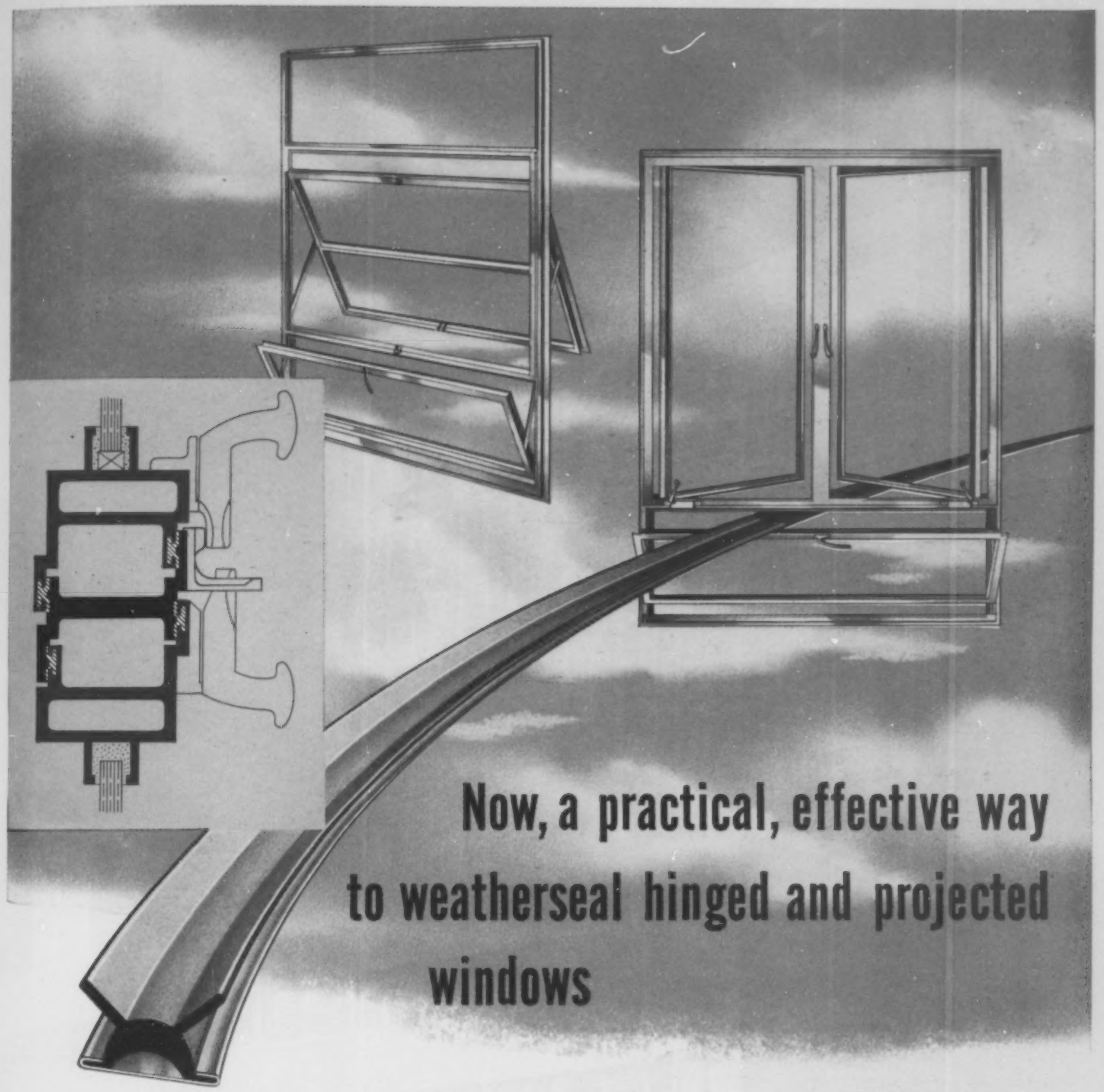
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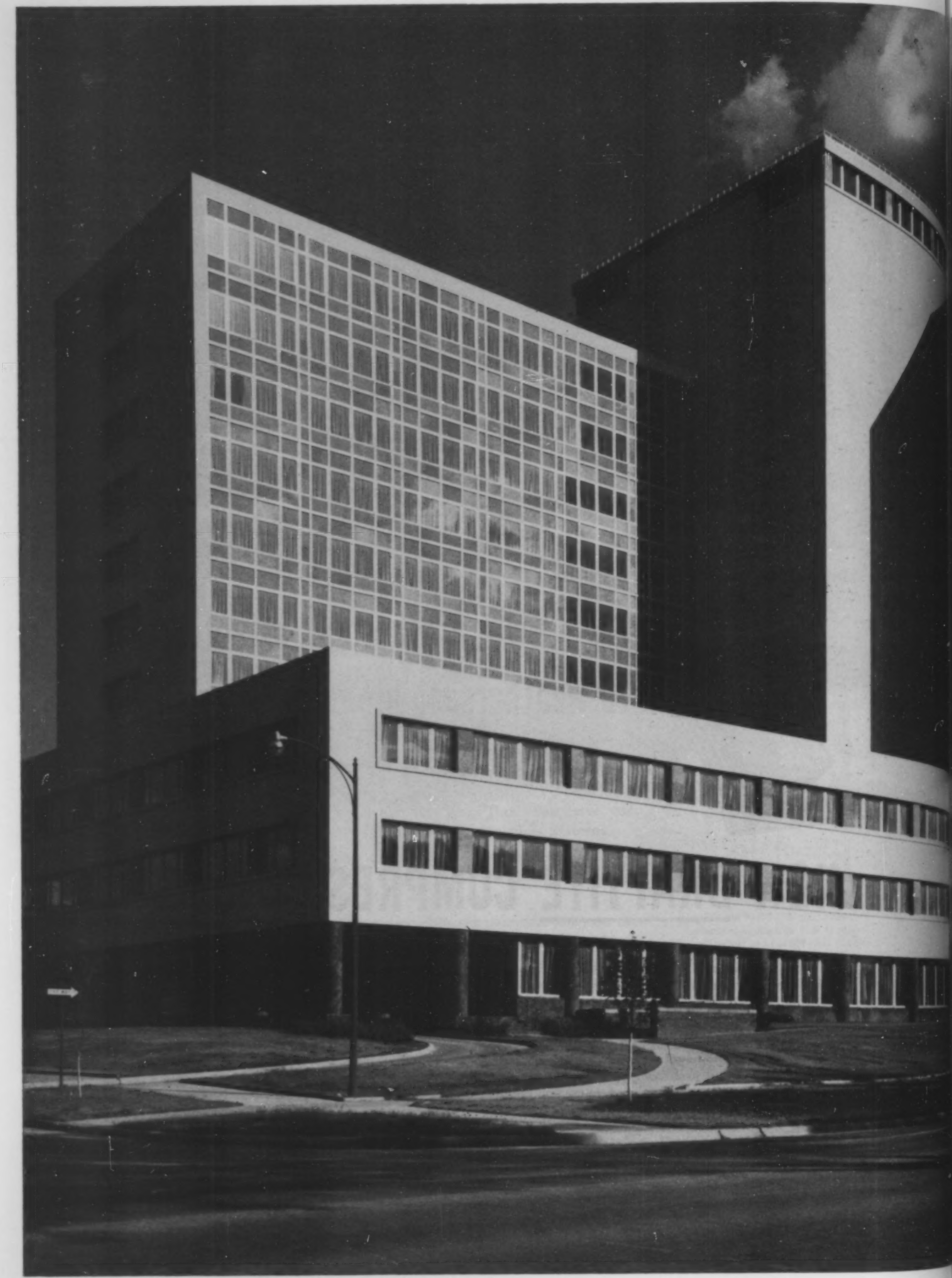

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**In designing** the splendid State Office Building in Topeka, Kansas, shown here, prime consideration was given to the importance of having the greatest interior comfort, as well as an exterior of commanding eye-appeal. That is why Solex®-Twindow® units were chosen for the many window openings in this building, as well as Solex Polished Plate Glass for the exterior doors.

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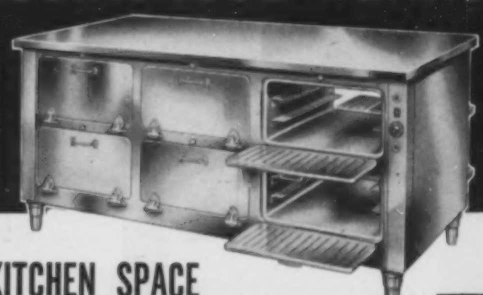

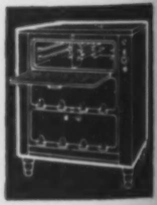

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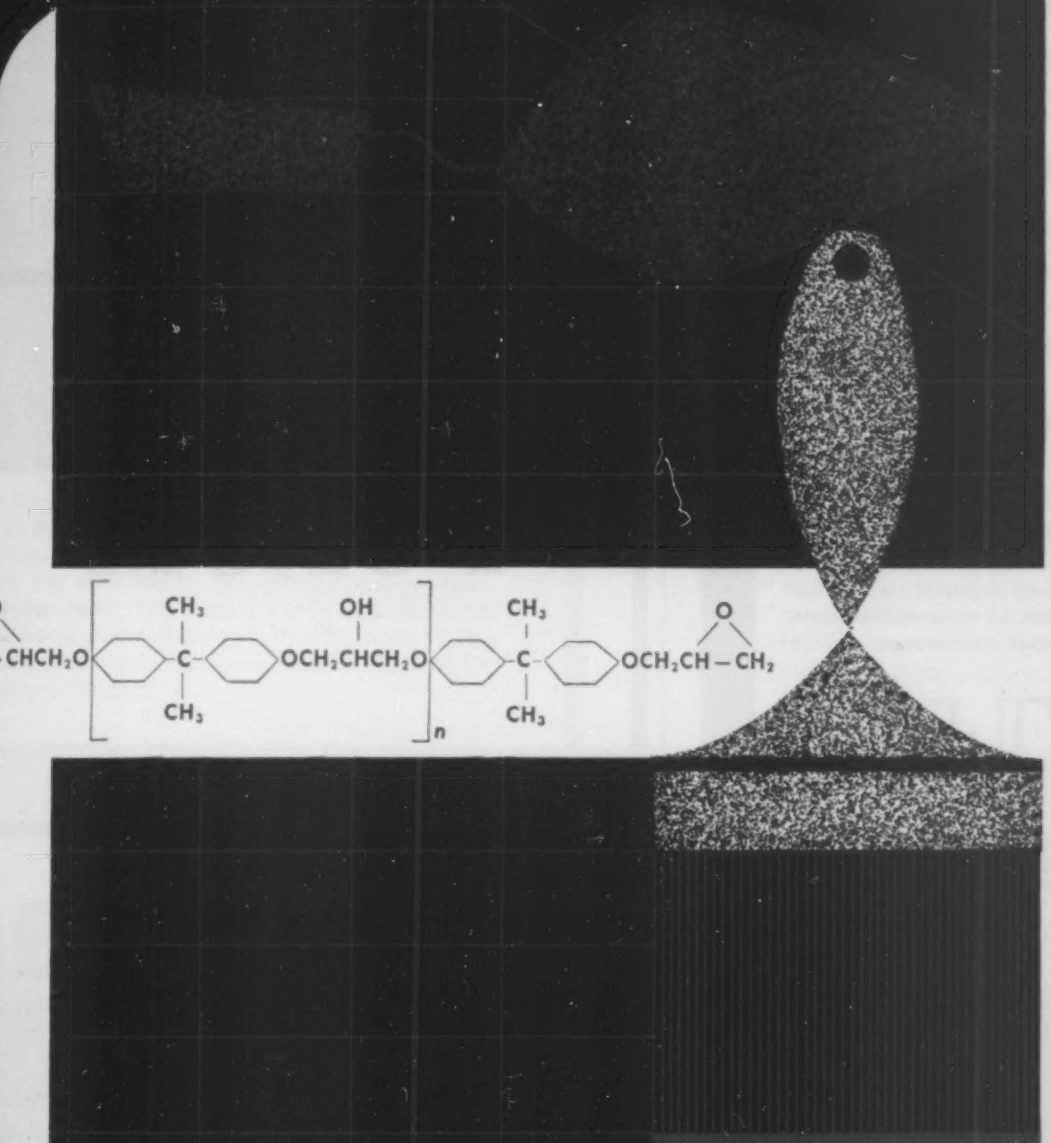

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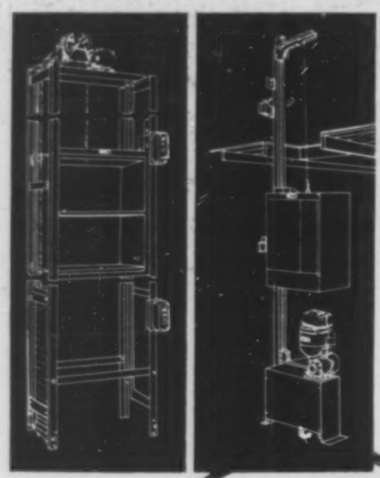

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Earl Henderson, Assistant Cashier and Superintendent of Buildings for The Philadelphia National Bank, and John Kennedy, Main Office Building Supervisor, check the comfortable new officers' lounge. Says Mr. Henderson: "This room is part of extensive bank remodelling aimed at giving the public modern, efficient facilities and employees cheerful, comfortable working conditions."

Send for this Free Booklet!
...tells how to improve washroom efficiency, appearance with the help of **Scott's Washroom Advisory Service**

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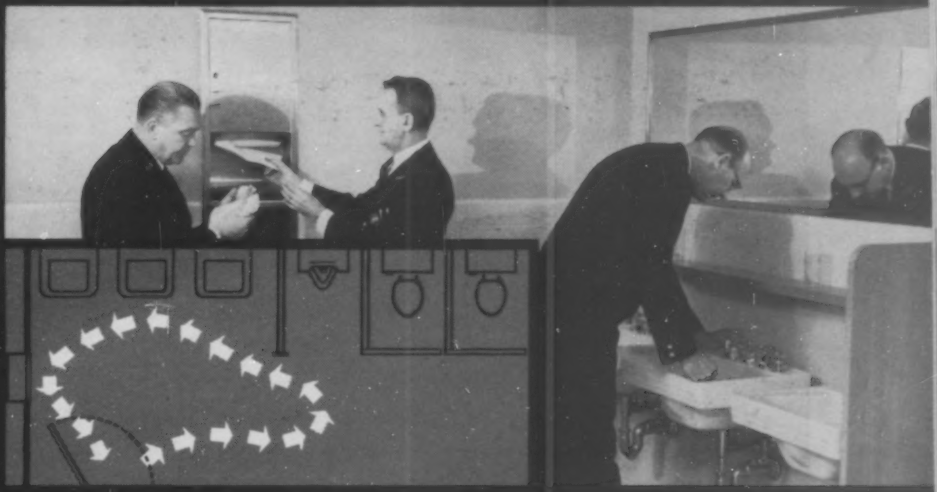
For "quick changes" and ideas on how to improve washrooms NOW, see Scott's 14-minute film on washroom planning! Just mail the coupon.

About 225 employees use the cheerful, efficient washroom-lounge facilities, part of which are shown here in the ladies' lounge. "The entire bank was re-done," says Mr. Henderson, "and of course the washrooms had to be as modern and well-planned as the rest of the project. That's why Scott's suggestions were welcomed. Scott Washroom Advisory Service worked with the architect. Results: excellent!"



Guards' washroom: recessed cabinets, off-the-floor equipment, tile walls and floor, modern lighting, scientifically planned soap supply, smooth traffic flow to washbowls, towels, disposal, exit. In short, this room—and 16 other washrooms serving 8 floors—embodies a great many of the principles of Scott's Washroom Advisory Service. (There is no charge or obligation for anyone calling on this service.)

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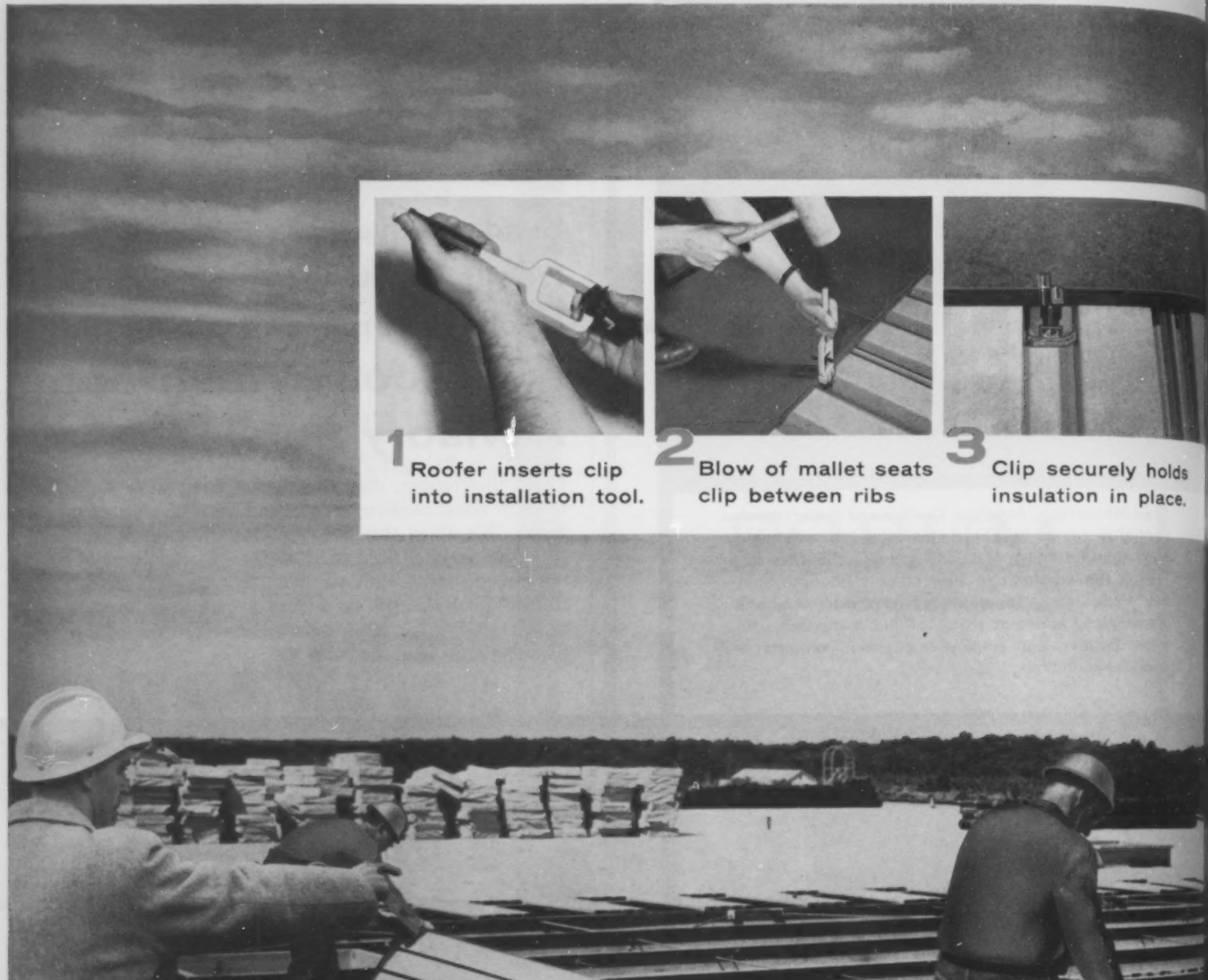
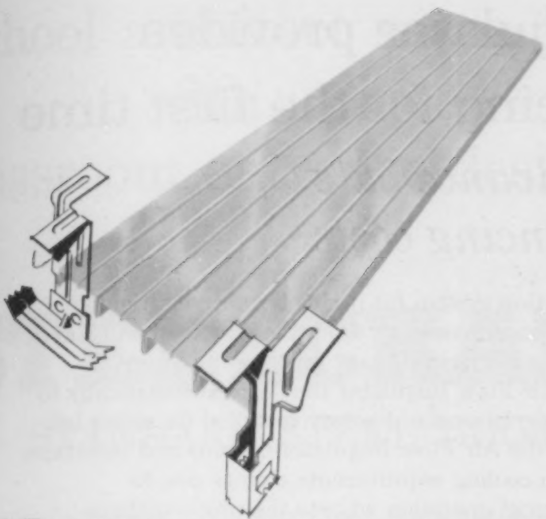


1 Roofer inserts clip into installation tool.

2 Blow of mallet seats clip between ribs

3 Clip securely holds insulation in place.



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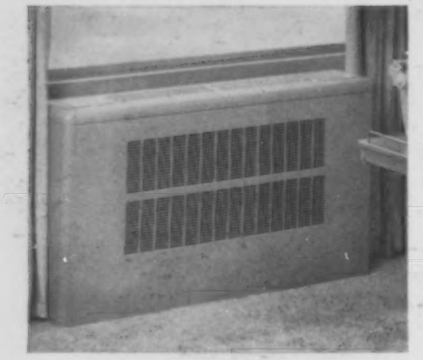

Now, use a high pressure induction system for perimeter air conditioning of big buildings that will be balanced correctly from the start and will stay in balance automatically. TRANE engineering now brings you induction UniTrane units with the new Air Flow Regulator that acts automatically to assure proper air delivery and performance. Factory installed for either left hand or right hand air supply, the Air Flow Regulator obtains and maintains uniform air delivery. And when cooling requirements change due to tenant changes, one simple manual operation adjusts the unit—without affecting any other units in the system.

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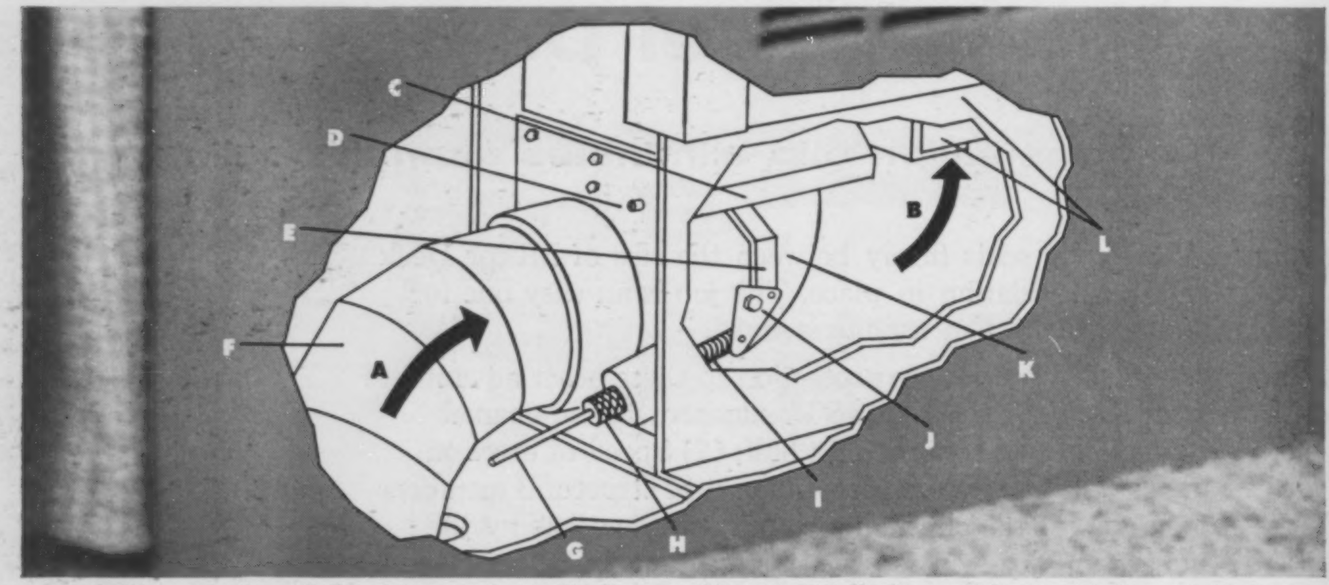

**(A)** duct pressure **(B)** plenum pressure **(C)** diaphragm **(D)** vent **(E)** diaphragm linkage **(F)** air supply duct **(G)** adjusting rod **(H)** locking knob **(I)** spring **(J)** lever **(K)** damper **(L)** baffles

**HOW THE NEW TRANE AIR FLOW REGULATOR WORKS:** Operating on the principle of opposed pressures, the new TRANE Air Flow Regulator is easy to balance, stays in balance automatically.

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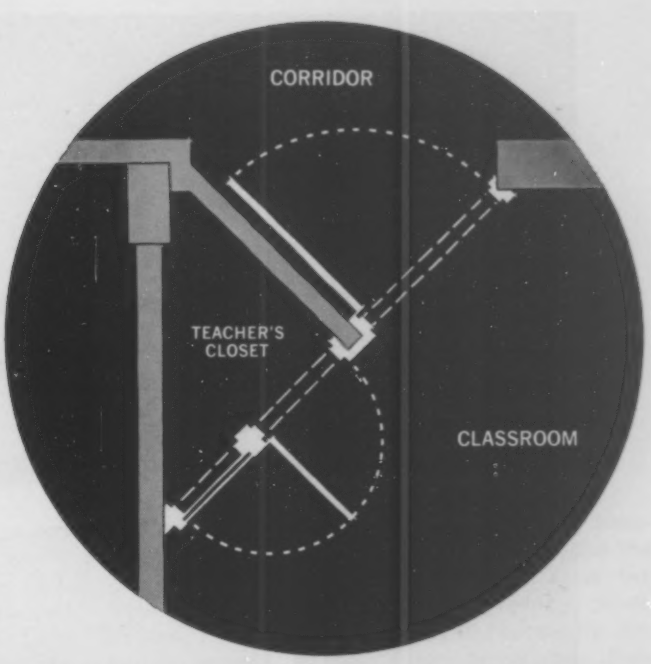

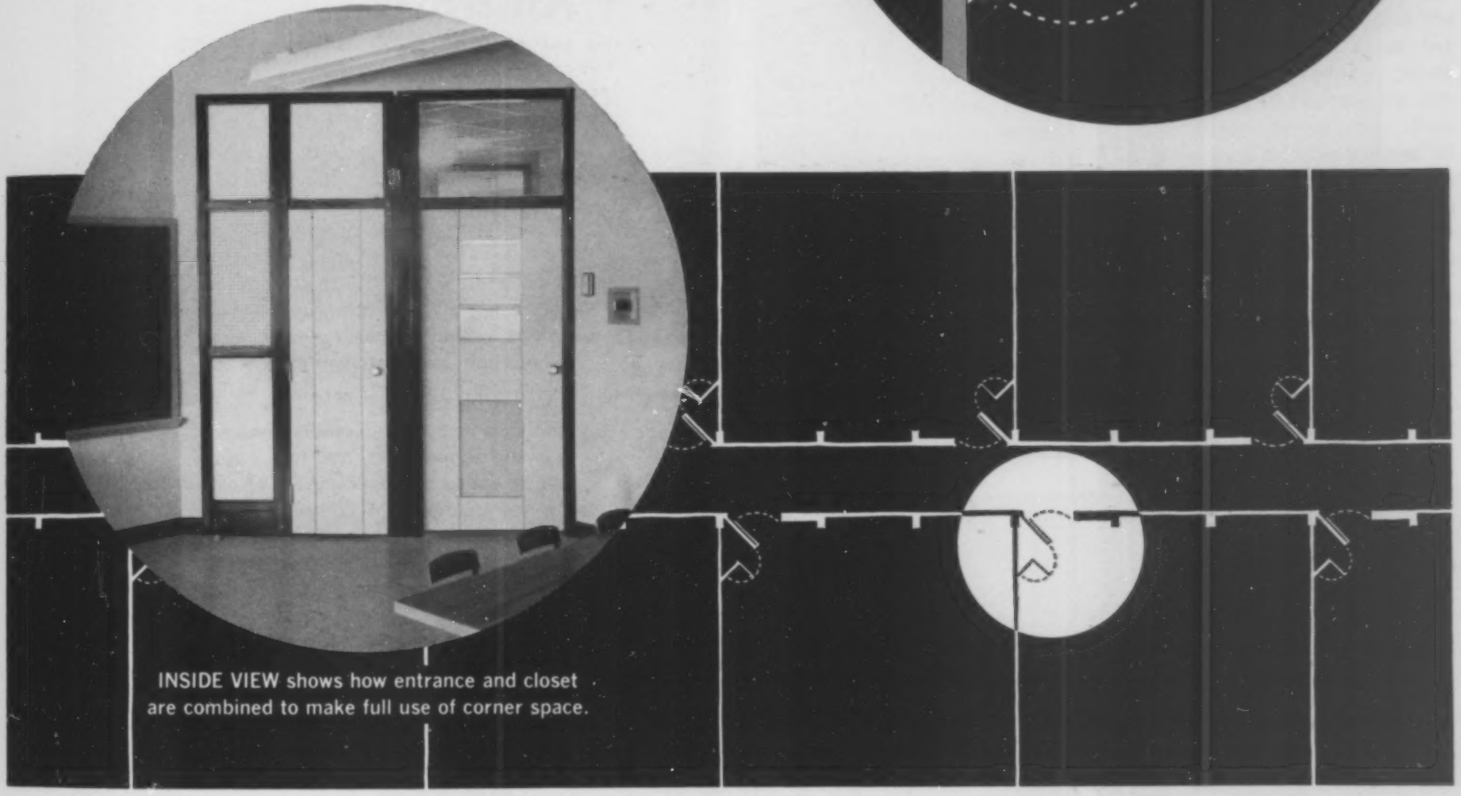
INSIDE VIEW shows how entrance and closet are combined to make full use of corner space.

Miami Shores Elementary School, West Carrollton, Ohio     Architect: Walker Norwick & Associates, Dayton, Ohio

To reduce corridor width and still meet code requirements for unobstructed traffic flow, the architect positioned entrance doors in obliquely recessed openings so that they would not swing into corridor. This angular entrance design cut 3 feet off corridor width, resulting in substantial construction savings.

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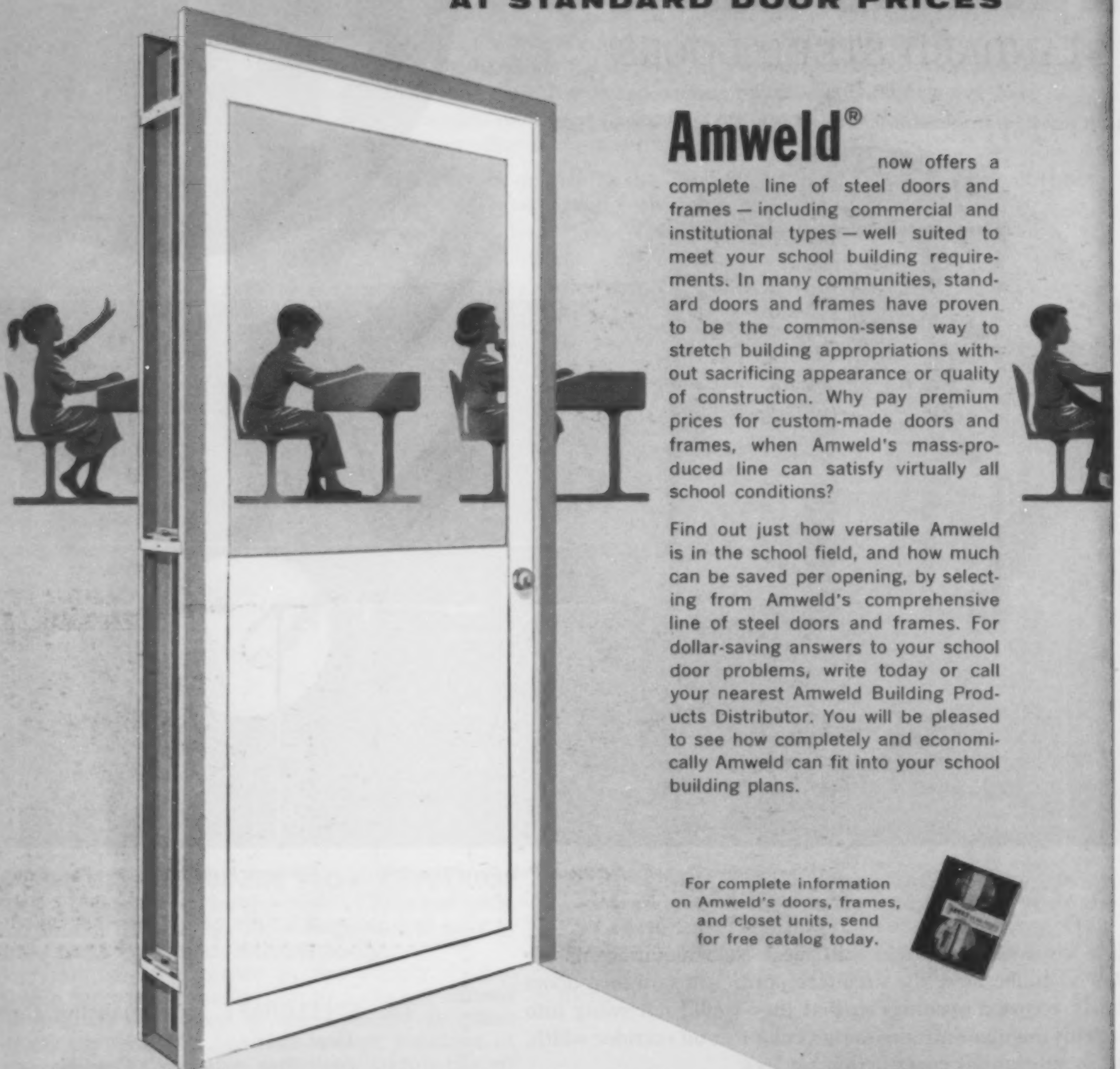

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For complete information
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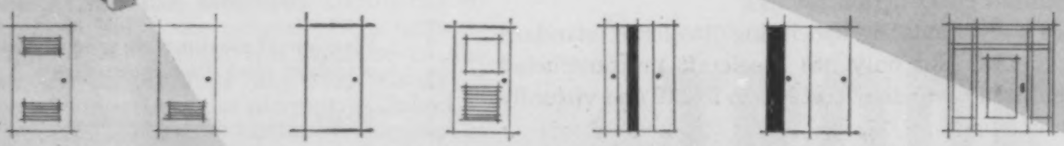

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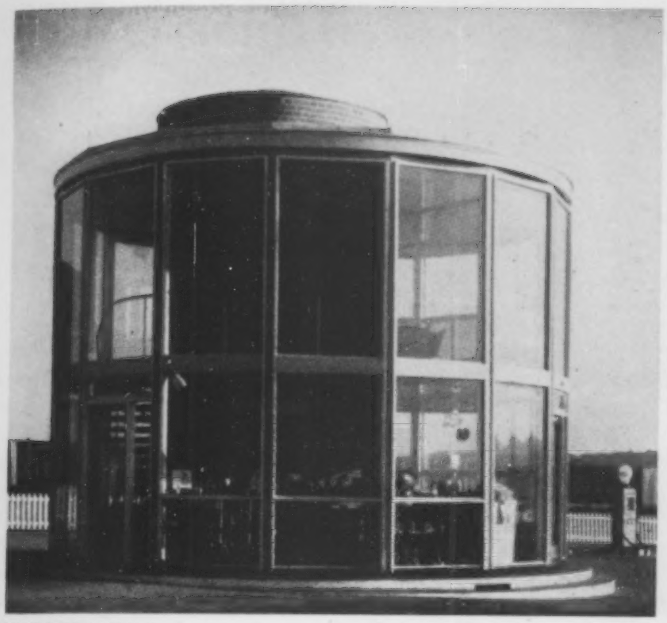
# Abroad

## A continuing review of international building.



ARCHITECTURAL REVIEW

### BRITISH DRUM

The oil business has traditionally been in too great a hurry to be much concerned with architecture. The design of most filling stations, consequently, is definitely prosaic. A handsome exception is this glass-walled Shell filling station in Kent, England, by Architects Burkett, Sheer & Wilkinson. The brick core within the glass drum serves as a structural column, housing a storeroom below and the rest rooms above. From the core, floor and ceiling joists radiate out to the nearly circular showcase exterior. Perhaps a part of the success of the new station is the attendants' ability to spot customers in all directions, but a larger part is surely the customer's pleasure in good design.

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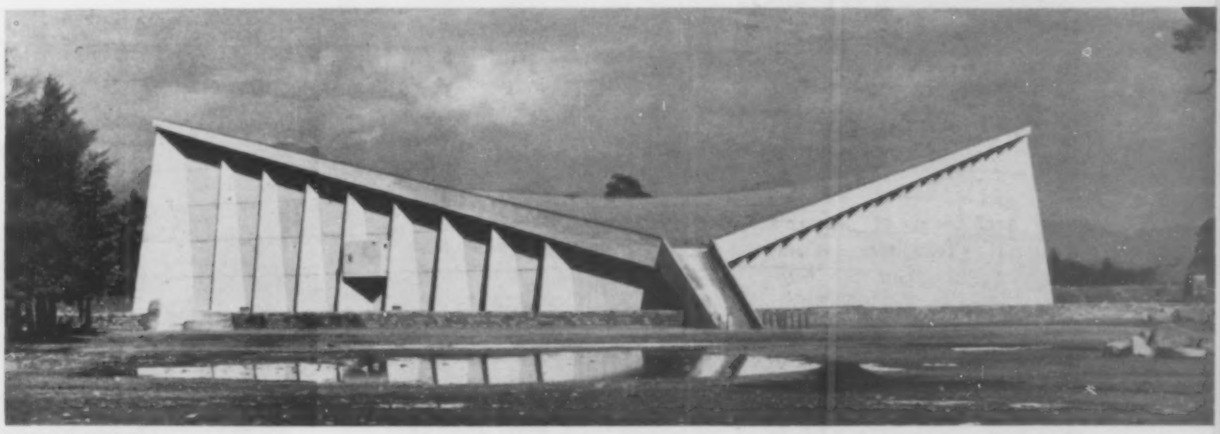
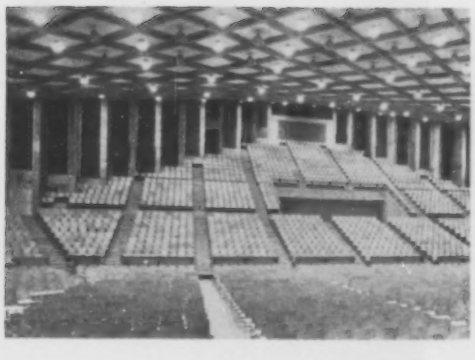
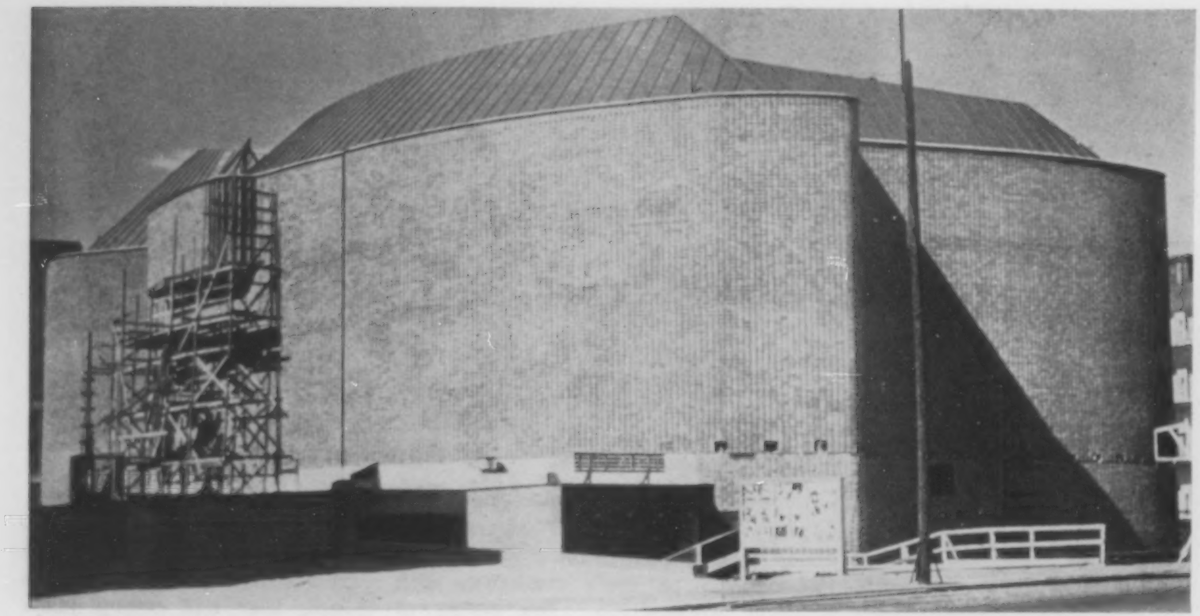


PHOTOS: E. TORIHATA

### JAPANESE SHELL



Japan's Architect-engineer K. Tange is famed both for his highly original concrete structures and for his ability to translate into Japanese style architectural and technological experiments from other lands. In designing this convention hall at Shizuoka, he focused both talents on the same job. The reinforced concrete hyperbolic paraboloid is both a strikingly individual work and an echo of the late Matthew Nowicki's Raleigh (N.C.) Livestock Pavilion. Curiously, one of the major criticisms of the Nowicki pavilion (that details such as gutter spouts were neglected—FORUM, April 1954) is massively corrected in the Japanese version. Other noteworthy details include the building's huge concrete louvers and its unique seating arrangement (left).



L'ARCHITETTURA

### PALACE IN HELSINKI

The latest work of Finnish Master Architect Alvar Aalto is his massive "Palace of Culture" in Helsinki. Undulating like a form that is still in the process of development, the building pushes the peak of its highest roof some 130 feet above the floor of the main lobby. To give color and texture to the lofty exterior, Aalto designed a deeply grooved wall of special barn-red masonry blocks. The main bulk of the building houses the cultural center which consists of two theaters, a large conference hall, and a restaurant and kitchen. Attached to the center is a severely functional, three-story office wing.

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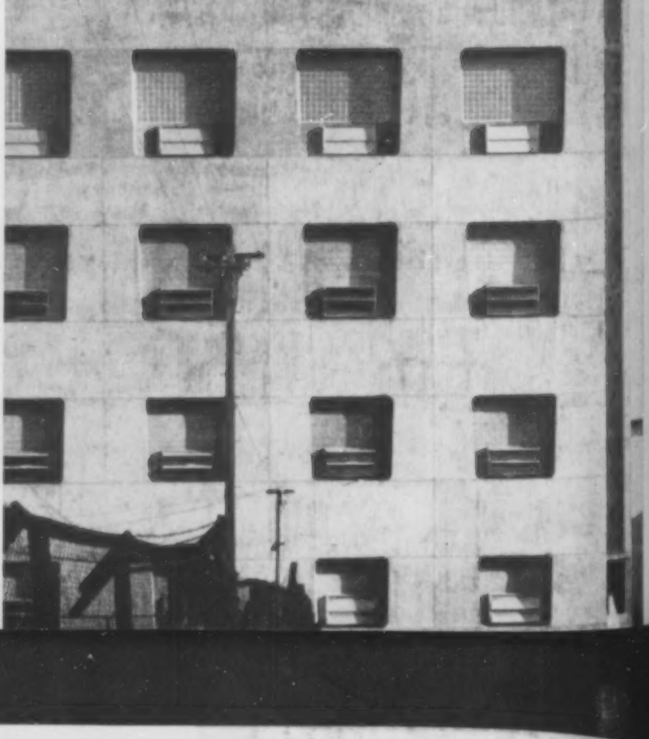
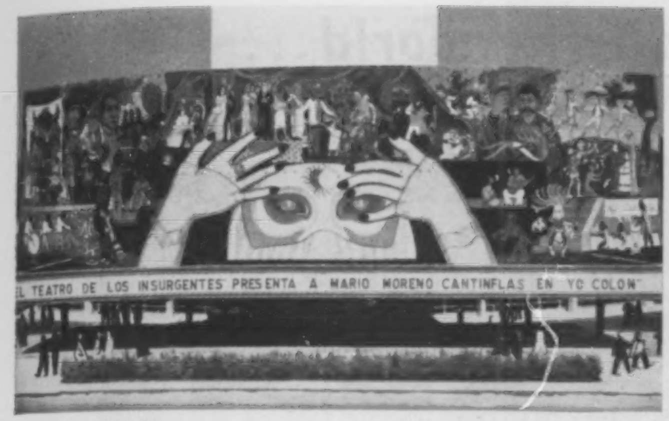
### IMPASSIVE IN KASUMIGAURA

The architects of Japan's National Telephone Company, working on the telephone office in Kasumigaura, had hit a snag. They had found that the ground-level thickness of the muscular wall columns proposed for the building would reduce first-floor windows to mere holes in the wall. Upon checking, however, they discovered very good news: big windows were not required on the bottom two floors; in fact the openings had to be only wide enough to accommodate ventilators. They went ahead with their original plan and designed a reinforced concrete wall that is as strong and impassive as could be wished (right). Unfortunately the over-all form (below) is not so handsome as the façade.

PHOTOS: F. MURASAWA




EL TEATRO DE LOS INSURGENTES PRESENTA A MARIO MORENO CANTINFLAS EN "YO COLON"

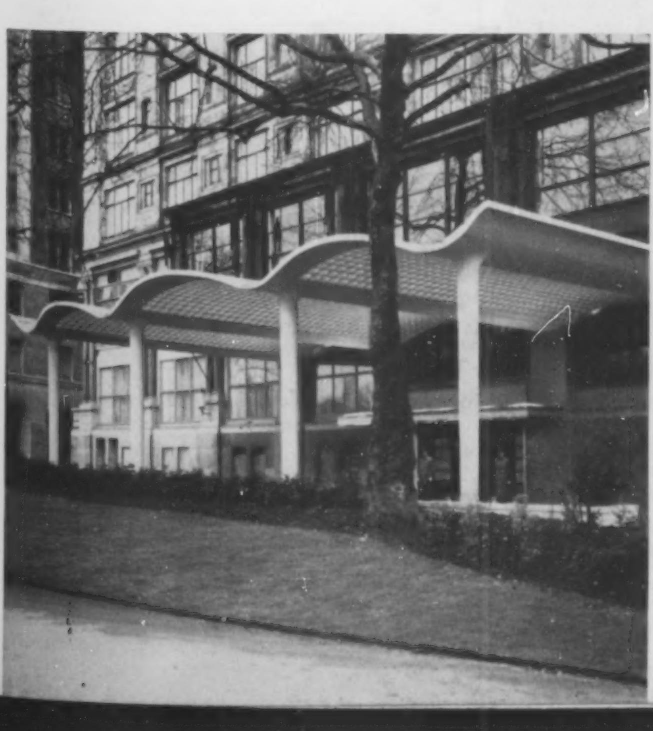
ARCHITECTURAL REVIEW

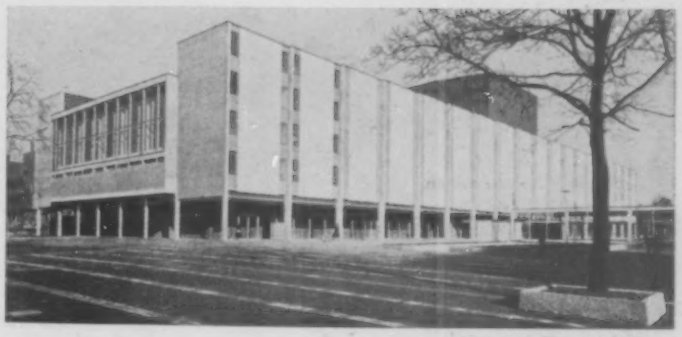
### SCALE IN THE CITY

The last work of Mexico's great muralist, Diego Rivera, attracts passers-by to the new "Theater of the Insurgents" in Mexico City. The mural encompasses all the drama of Mexico's revolutionary history, all the glamour of moviedom, and is also an admirable example of what a well-planned wall can do for the scale of a building in a fast-paced city. Even from a distance, as the first-nighter is driving down the avenue, Architect Alejandro Prieto's theater is an eye-catching, exciting experience.

### RAIN IN LONDON

London's fashionable and staid Savoy Hotel has finally decided to meet the twentieth century face-to-face. Guests entering and leaving the hotel in rainy weather had long complained that the hotel's canopy did not provide enough protection out to the doors of waiting cars and cabs. Last year, therefore, the Savoy commissioned Architect Eric Janes to propose something more convenient. Disguising his modern purpose only slightly by calling it a porte-cochere, Janes designed a delightful floating shelter. And by picking up the rhythm of the façade (photo below) and by a nice sense of scale, he managed not to affront the Savoy's dignity.



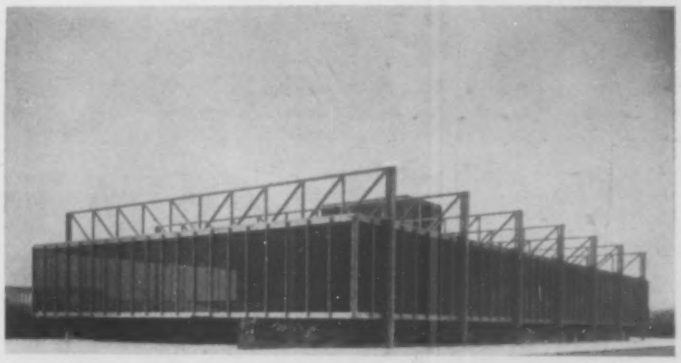


ARCHITEKTUR

### GHOST IN MANNHEIM

Five years ago the world of international architecture was shocked, then fascinated by Mies van der Rohe's competition design (below) for the National Theater in Mannheim, Germany. His proposal solved the problem of putting two auditoriums under one roof by devising a gigantic box suspended from seven overhead trusses. In the box there was more than enough space for all desired activities. Critics pointed out at the time that Mies's decision not to present a standard, pie-shaped, sway-backed theater and his talk of "universal space" was beyond popular taste of the day. The competition was won by Frankfurt Architect Gerhard Weber, who had paid somewhat closer attention to details of the theater's special demands. But the Miesian design had such pervasive influence on thought regarding the theater that in Weber's final proposal (above) ghostly traces of Mies's fine lines and spacial concepts can be seen. The new theater is undeniably a big box, held up off the ground by stilts rather than trusses. The wings on either side of the box, however, express nothing but a wish to be different.

HEDRICH-BLESSING



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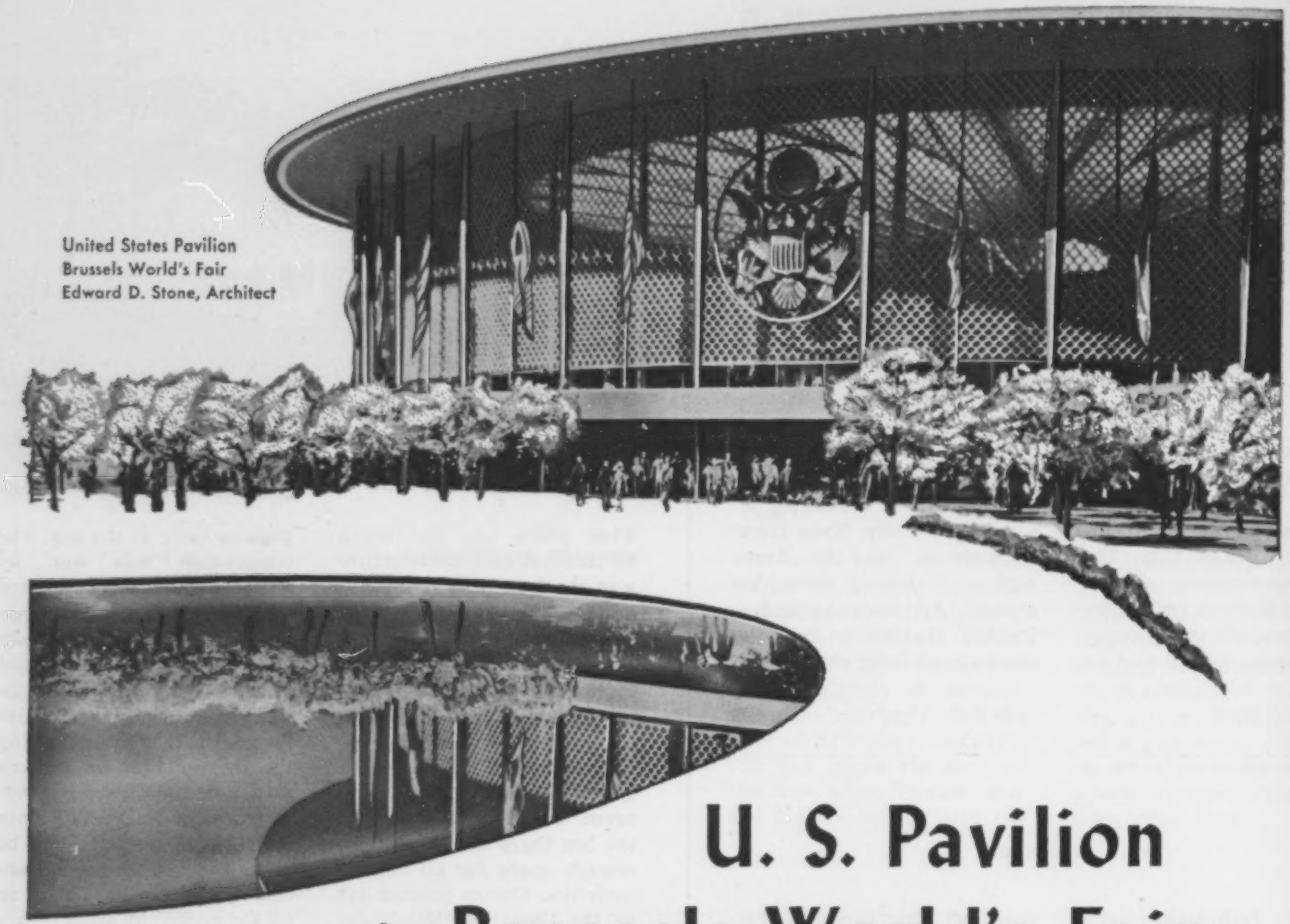

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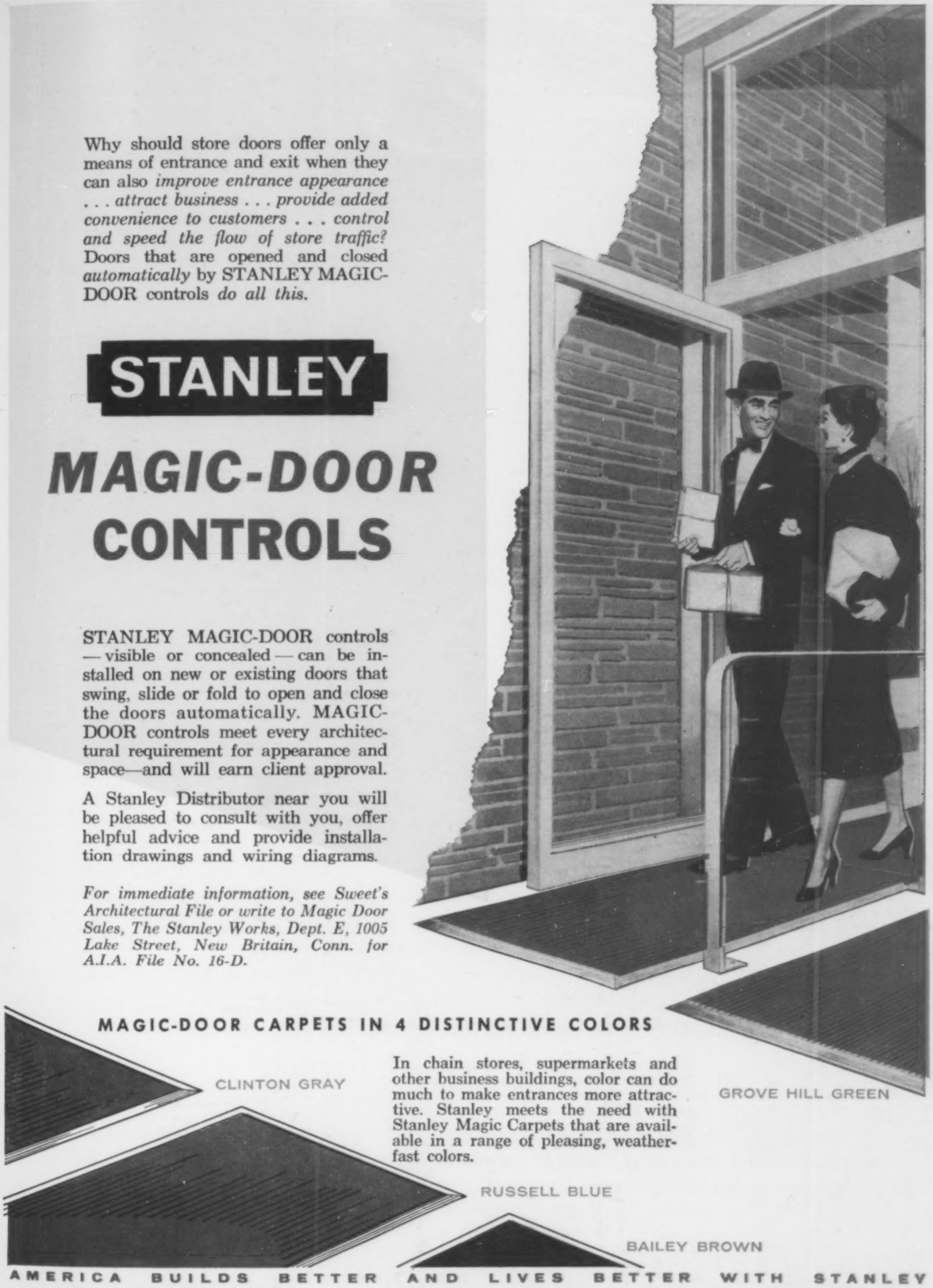

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